NOV 17

No 27 JANUARY 1927

PSYCHE

PUBLISHED QUARTERLY

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KEGAN PAUL, TRENCH, TRUBNER & Co., LTD.
Broadway House, 68—74 Carter Lane, London, E.C.

W. W. NORTON & CO., INC.
70 Fifth Avenue, New York.

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John B Watson

JOHN B. WATSON

P S Y C H E

JANUARY, 1927

EDITORIAL

THE NEW WORD

Dr. John B. Watson must be astonished at his own success. He made a special study of Thought, and loudly declared—first in 1912, and again in 1919—that there was no such thing. He did not qualify his statement. He did not say, as it were: What you see when you say you see a ghost is really a sheet on a post. He just declined to interest himself in ghosts and studied posts.

Behaviorism was born, and proved to be the study of behaviour; particularly the behaviour of the larynx. Then in 1925 came the book *Behaviorism* which everyone is reading, since it tells in simple language what the earlier volumes were about. " Perhaps this is the most important book ever written ", said the New York *Herald-Tribune.* " It marks an epoch in the intellectual history of man ", echoed the New York *Times.* But Dr. Watson had already gone out of psychology as a business, and into business as a psychologist.

That is all American history, you reply. Behaviorism could never make any impression in England. A very good reply—until Mr. Bertrand Russell read the book and declared in the August number of *The Dial* that he considered it " massively impressive ". So impressive, indeed, that he went so far as to object to the theory of *The Meaning of Meaning* on the sole ground that it introduces the term ' thought '. And now, in the December *Century* he has gone even further and declared that there are "as many behaviorists as there are modern-minded men ", and adds, " I have the highest admiration for Dr. Watson and consider his latest book enormously important." There is nothing markedly American about Mr. Russell, so this opinion may prove contagious.

Meanwhile our contributor Professor W. M. Wheeler has deserted his Ants to see what all the fuss is about. In the *Quarterly*

Review of Biology, he publishes the results of his inquiry. The old-fashioned psychologists, he finds, are in tears on account of the bull's behaviour and the devastation he has wrought in their china-shop. But he thinks both parties are to blame: " the china-shop keepers for setting such store by their fragile, antique wares and their love of exposing them without adequate safeguards, and the bull for smashing them. Perhaps, however, the bull is the less culpable, because the shopkeepers have of late been too enthusiastically convincing him that he is a connoisseur in porcelain."

Psychology, he continues, is universally admitted to be a queer science, and one can hardly fail to observe that its queerness, apart from the peculiarities inherent in its subjective subject matter, is due in no small measure to the mental peculiarities of its devotees. " When we consider that, with very few exceptions, the men who have developed psychological science have been either philosophers, priests, or pedagogues, or hybrids of all three, its strangely inhibited, not to say eunuchoidal, aspect is easily understood. To put the matter *crue, nue, verte, et sans phrase*, these doctrinaire individuals seem always to have a horror of admitting to themselves and others that they are and will always remain individual mammals of the Family Hominidæ and the Order Primates. Their professions require that they shall give the impression that they subtly vegetate on cloudbanks of ratiocination and pure asexual love and that they possess little or no first hand acquaintance with the instincts, emotions, or appetites, not to mention uglier propensities."

Hence their concentration on the most anaemic psychic processes—consciousness, sensation, perception, apperception, memory, attention, ideation, volition, etc. Whence the chance for Freud and for Behaviorism too. " To the biologist the whole situation is replete with fun and confusion ", for both Watson and his opponents seem to be unaware of the long line of behaviorists from Réaumur to Burdon Sanderson who have been quietly getting on with the job. Behaviorism, then, as has been pointed out more than once in *Psyche*, is merely the most recent and most fashionable name for a long-established department of biology. And the next step, as Adelyne More remarked over two years ago, is for someone to realize that this branch of science might be brought up to date by an intelligent application of linguistic psychology. Even Professor Wheeler admits, however, that Watson's new book " provides many fresh incentives to the further investigation of man's basic nature ".

LUCRETIUS REDIVIVUS

THE HOPE OF A CHEMICAL PSYCHOLOGY

By JOSEPH NEEDHAM
Fellow of Caius College, Cambridge

> *is tibi nunc animus quali sit corpore, et unde*
> *constiterit pergam rationem reddere dictis*
> *principio esse aio persubtilem, atque minutis*
> *perquam corporibus, factum constare* . . .[1]
>
> LUCRETIUS : *De Rerum Nat.*
> Book III, lines 177-180.

In this essay we shall try to make an ascent of that hoary and contemptuous peak, the psycho-physical problem. The view from the top will surely be magnificent, if ever we get there, and if we are not deterred by the list of philosophers who have set out on the same journey and never returned—Gassendi and Mill, Clifford and McDougall. Our equipment, the essence of which is expressed in the title, may at first sight seem ludicrously inadequate, out-of-date, even foolhardy. But if anyone were to suppose that in choosing T. Lucretius Carus to be our Virgil we were choosing that same young man who, in the year of the founding of the city 690 or thereabouts, wrote six books on the nature of things, they would be somewhat mistaken. No; Lucretius has learnt much during his sojourn in the realms of Rhadamanthus, and he who shall tread with us the slopes of our incipient mountain has come to look upon the atoms of Abdera as true, yet not, as once he thought, the entire and whole compendium of truth.

The Lucretian title, odd though it seems, has been chosen for definite reasons. Much has been heard in the past fifty years of physiological psychology, a phrase which has had its affirmatory enthusiasms as well as its voices of execration. But now it is biochemistry and not the classical physiology which is important in this connection; for while the latter may be content to arrange the phenomena of life in provisional concepts of its own devising, the former, committed as it is to exact physico-chemical notions, interposes nothing between the affairs of living organisms and the fundamental properties of matter. In this way the psycho-physical problem emerges with especial clearness out of the clouds; and with the properties of electrons on the one hand and the phenomena of embodied minds upon the other, we are not hampered at the outset by half-way house entities invented *ad hoc*. The question at issue is whether any close relations between mental and physico-chemical phenomena are possible, and whether any are known. We may consider first whether, on general grounds, we should expect to find any such correlations; and next see if experiments supports theory in bringing forward definite cases. How far, we may ask, does the realm of the atoms stretch? The ground that has to be covered makes it impossible to support with detailed arguments the theses that I shall have to maintain, but some of these will be found in other essays. Here I shall only, as it were, stick little flags into the map in order to indicate what way Lucretius and I are going to take to get to the top.

---

[1] Now of what substance and what stuff composed
Is the whole mind, I will proceed to tell;
First I affirm that atoms subtle and small
Do make it up : this we may demonstrate . . . .

In the first place, then, I consider that the scientific method, with its dependence on Induction, its constant employment of the statistical process, its inevitable intellectual analysis of its subject, and its alliance with practical ends, can not be considered the only way open to man in his longing to move towards the essence of the world. It is obvious at once how much Lucretius differs from his former self. He can now admit that the atomistic world-outlook, the scientific method, the quantitative universe, is only one way of looking at the real. In its way it is legitimate, in its own sphere it is, indeed, unassailable, but it is not a philosophy. To regard it as the singular approach or even the principal path to truth is to fall back into the pit of scientific naturalism out of which we have so diligently been climbing since the middle of the last century. It would be to succumb to what A. S. Whitehead has called "The Fallacy of Misplaced Concreteness". As F. H. Bradley once said, "When natural science, becoming rampant, sets out to explain the universe finally, it ceases to be respectable." We must believe that other kinds of human experience give valid accounts of the real, and that forms of human activity such as philosophy, religion, aesthetic appreciation, and poetry, for example, produce autonomous interpretations of the nature of the universe. But I am also concerned to affirm, as against those who would too straitly restrict its value, that the scientific method takes its place as one of these realms of experience, providing for us a series of answers to questions limited in their essence but infinite in their scope. We might put it in another way and maintain that just as the poetic genius can turn to its own uses anything in heaven or earth, so the scientific approach can deal with all phenomena, no matter what their obscurity, their complexity, or their sanctity. In neither case do we get a full picture of the real, for each manner of envisaging it suffers from inherent discordances and distortions; but it is part of man's heritage that he cannot do two things well at the same time.

The mechanistic theory of life, then, to which, as practically all working biologists admit, the scientific approach stands committed, is not a philosophical theory or a metaphysical system like the simple materialism of de la Mettrie (10) and Cabanis (6), but a scientific hypothesis, the basic hypothesis in fact, and one which works extraordinarily well. The mechanistic conception of living organisms is necessitated by the fact that science is, above all, a system of measurement. What can be weighed or made measurable is susceptible of scientific treatment; elements of experience which cannot be so discussed are left on one side until they can. As science advances the merely qualitative is continually discarded and goes to form parts of those questions which cannot be answered because their terminology has become obsolete. In this way did teleology disappear from physical science, and though it still lingers in biology, its summons has come, and it is about to depart. In this way it is that vital forces, entelechies, and hormic urges are irrelevant and useless in science, for nobody has ever proposed a manner of measuring them, and until that is done they will remain ornamental phrases devoid of scientific meaning as well as of scientific fruitfulness. They are a modern company of vestals, all, like Bacon's final causes, dedicated to God, and barren.

But to admit the supremacy of mechanism in biology is not to grant it more than scientific rank; and we may find ourselves in agreement with Lotze, who said, "Nowhere is mechanism the essence of the matter, but nowhere does being assume another form of finite existence except through it." Lotze held that mechanism was universal and at the same time secondary. I have elsewhere applied the term 'Neo-mechanism' to a biological standpoint of this kind. The neo-mechanist realizes to the full the disreputableness of scientific naturalism, and the consequent fictional character of the mechanistic world-view. It represents nothing real about living organisms. But where he differs from the Neo-vitalist, with whom he has nothing in common but a prefix, is that he believes mechanism to be not only a useful, but an essential fiction. In the laboratory it is necessary for the investigator to experiment AS IF the mechanistic theory of life were true. The poet and the philosopher do not labour under this disadvantage, though they have others of their own. The atoms of Lucretius are the life-blood of science, and his rigid determinism the only air which it can breathe. That is its peculiar constitution, it cannot be other.

To some this subjectivation of mechanism may seem to carry fatal results for the prestige of science. They may take heart at the thought that the other disciplines of man's thinking and feeling have each their own distortions, delusions, and fictions. And even if the universe which science reveals to us is not the real universe any more than that of the poet, even if the speech of science is more halting and imperfect than we could have believed, there will ever be something very noble in the habits of mind to which scientific research gives birth. As our present guide said once :—

> " For just as children tremble and fear all
> In the viewless dark, so even we at times
> Dread in the light so many things that be
> No whit more fearsome that what children feign,
> Shuddering, will be upon them in the dark.
> These terrors then, this darkness of the mind,
> Not sunrise with its flaming spokes of light
> Nor glittering arrows of morning can disperse
> But only Nature's aspect and her law."
>
> " Non radii solis neque lucida tela diei
> discutiant, sed naturae species ratioque."

Now the question is exactly how far can the mechanistic fiction be made to extend. Are mental phenomena impregnable ? At one time I thought so, and doubted whether bio-chemistry, the psycho-chemical study of life, could have anything to say about phenomena usually regarded as essentially not physico-chemical. It seems to me now that, after its own manner it may have everything to say. Let us take, for purposes of exposition, a thoroughly extreme case. Some day some group of bio-chemical investigators may prove that a deficiency of sulphatide phosphorus and a high oxidation-reduction potential in a certain area of the cerebral cortex is invariably associated with the creation of great poetry. Obviously such a suggestion is as wild as can be, but it is nevertheless a legitimate extrapolation from facts already known. I introduce it here as a kind of reagent, with which to test the behaviour of various people confronted with it. Now the scientific naturalist of the old school, faced with such a state of affairs, would find himself in a distinctly unpleasant position, out of which he could only emerge on the condition of denying all validity to the notions of reality emanating from the poets. He could certainly not accept in any form the 'revelation' theory of poetry, for the determinism of science would be fully covering the ground, and the poetic would be directly dependent on the metabolic fire. Biochemical equilibria in the poet's brain, dependent on a chain of causes and effects remounting, like an apostolic succession, to the original winding up of the energetical clock, and apparently related to the mathematical laws of chance, would govern the nature of his utterances. John Davidson's " The way is steep, but I would have it so, And dusty, but I lay the dust with tears ", no less than Robert Browning's " All's right with the world ", would be causally related to different membrane potentials or hydrogen-ion concentrations in the cerebral cells.

It so happened that by a clear foresight, the advocates of scientific naturalism did make a series of such denials of validity, not only as regards poetry, but as regards philosophy also. On almost every page of the *Grammar of Science* Karl Pearson registers his opinion of the " morasses of metaphysic ". And their more crude adherents formed that school of 'medical materialism' which was one of the most conceited and irritating inhabitants of the intellectual world of the last century. One is reminded of what Epicurus thought of Homer.

Moreover, if the discovery of which we have spoken above were actually made, the modern neo-vitalist would find himself in a corner also. It is amusing to picture him escaping out of it in the usual way, by drawing attention to the capacity for the creation of great music, which would not have been brought into relation, up to that time, with any definite chemical fact.

But to the Neo-mechanist such a correlation would present no stumbling blocks. If anyone is prepared for what the future may bring forth, it is he. He would feel nothing but pleasure that the poetic faculty in the mind of man had been brought under the domination of the mechanical scheme of things, that realm in which measure and weight are the supreme dictators and in which absolute determinism carries the rôle of chief justice. Yet who would know better than he the limitations of that kingdom, its frontiers and its bounds? The mainsprings of the poet, it would be agreed, had been found capable of expression in physico-chemical terms, in the domain of the electron and the atom. Yet the beings who founded that domain and drew up its charters were nothing less than minds; therefore identical with the poet. The biochemical cloak which had enveloped this mental phenomenon was in the original fount of time, brought forth by the very same artificer whence the poetry sprang; nor is it fantastic to say that all the activities of the scientific investigator could by the operation of the poetic genius be transmuted into another tongue. " Flammantia moenia mundi ", whispers my guide into my ear; " Once I did that not without merit, I think."

In this way a purely mental phenomenon would have been found to fit into the mechanistic universe; but that this was the last word on poetry, or that the mechanistic universe was the real universe, we should not attempt to believe. As far as science is concerned, the question of the origin of great poetry would certainly have been settled; but before the plenipotentiary jury could give a decision on its value, there would be other witnesses to be called—Art, Metaphysic, Religion, Ethics, Music, Mathematics, History; and last but not least the prisoner herself would suffer a cross-examination. The eventual verdict then to be put forth exists even now in the recesses of speculation; it was hidden from Luther, Huxley, Loyola, and all the narrowly great, but Desiderius Erasmus knew it, and Thomas Browne was not obscurely cognizant of it.

This process of correcting one world-outlook by the others, this moderation of those specialistic attitudes, which left to themselves are so often apt to be extreme if not fanatical, has results in all spheres of life. The successful application of quantitative, physico-chemical, deterministic modes of explanation to psychological events, would not necessarily lead us to imagine ourselves mere marionettes at the mercy of the ceaseless play of the atoms and obeying only the laws of chance. That it would do so has been, perhaps, a popular belief. It would be an interesting occupation to trace the reverberations of the mechanistic theory of life in the affairs of Law, raising, as it would naturally tend to do, the difficult question of responsibility. But in truth the value and applicability of scientific fictions is irrelevant in philosophy no less than in practical life; and whatever mechanism can explain, nothing is diminished from our conviction of its abstraction and one-sidedness.

Another point of some importance arises here. The attempt has been made in the past to place both the spiritual part and the mechanical part actually in external things, and to call one the method of the other. This equation of the two hemispheres of events was what Lotze tried to do; having said that mechanism was universal and at the same time secondary, he placed the mechanical and the non-mechanical in objectivity, and endeavoured to show—as I think, unsuccessfully—how they intertwined with one another there. In the case of the imaginary discovery which we are discussing, the line that could be taken would be to assert that the chemical brain condition played an integral real rôle in the coming-to-be of poetic inspiration. This is the argument with which St. Joan, in Bernard Shaw's play, silenced Robert de Baudricourt.

> Joan : " I hear voices telling me what to do. They come from God."
> Robert : " They come from your imagination."
> Joan : " Of course. That is how the messages of God come to us."
> Poulengey : " Checkmate ! "

But this is not really a satisfactory answer, for Robert had a judgment of validity in mind. Such a position involves too great a mixture of spiritual and material processes, or rather, too much interweaving of philosophical and scientific arguments. The modern Lucretius has admitted a great deal, but he does insist that the atoms be left to themselves in their own sphere of description. Only one fiction should be allowed to hold the floor at one time. Both sorts of description, the mechanical and the non-mechanical, are essentially subjective, and they cannot be both projected at the same moment into external nature. It is better to acquiesce in an apparent contradiction, if need be, hoping that time will remove it, and in any case believing that activity itself is more important than the results of that activity.

Thus Lucretius and I expect that, in the future, biochemical experimentation, including under that head all the biophysics and biomathematics of the future, will reveal, strange though it may seem, the cerebral mechanisms associated with mental states. These states themselves, as far as science is concerned, must remain epiphenomena, side-issues, shadows, and their conative aspects illusions, since behaviour will be physico-chemically interpreted and even politics expressed, perhaps, in the terminology of the tropism. But for philosophy these states will have a real significance, for, in one way regarded, the whole universe of science is itself a great abstract construction produced by the activity of mind, and its results are far from having any metaphysical importance. We shall rest content with them as far as they go, and, correcting them with the wisdom gained in other realms of experience, set them in their proper place in the mosaic of our world.

Thus to the Neo-mechanist, as such, the problem of the relation between body and mind is unanswerable because to ask it implies that the words we use for dealing with each half represent something real. This they do not, for mechanistic and non-mechanistic alike are simply fictions. He is concerned to push mechanistic explanations as far as they will go, and he believes that they will go every inch of the way; but, to continue the metaphor, he does not for a moment suppose they cover the whole width of the road. Body and mind, like determinism and freedom, only appear as separate because we dissect them in thought; in themselves they are indissolubly one. Both kinds of descriptions being partial, distorted, and the offspring of the same creator, to try to employ both at the same time is to forget Joseph Glanvill's Aristotelian antagonist, who in 1668 objected to the wearing of spectacles on the ground that with two pairs superimposed you saw worse than with one. The ingenious explanations of psychophysical interaction due to Boussinesq, Clerk-Maxwell, and others, and recently well reviewed by A. Lotka, are therefore little more than a fascinating pastime, for they rest on the belief that one side of the equation is as real as the other. So it is, but the realness of both is meagre. It is like matching ghost with ghost in a shadowy wrestling match.

Thus we have arrived at the top of the mountain and have inspected the view. We have seen and honoured the initials I.K., H.V., scratched on the window-pane of the rest-hut. Now we shall descend on the other side and indicate the observations and researches which already justify a hope for the physico-chemical delineation of mental phenomena. It will be a hope only—this cannot too much be emphasized—but the "glittering arrows of morning" shall not find us overcome with sleep. It will be seen that the discoveries of which we shall speak as yet hardly touch the fringe of mental life, even such an apparently simple phenomenon as that of attention being so far out of reach. But the way is clear, and when biochemical methods have improved in delicacy and biochemists themselves in numbers, advances of a similar sort will not tarry in coming.

It will not be necessary to linger over the dreams and visions induced by the physical agency of drugs, for we are more concerned with action in the inverse sense, namely, the biochemical effects of mental activity. But it is curious that no one has yet attempted to study with good controls the effect of chemical configuration upon the kind of vision produced in this way.

We shall not be able to proceed far until we have at any rate looked in the face the problem of individuality. It is only recently that biochemical data have appeared that indicate the manner in which this problem may one day be solved. The older writers held out no hopes in this direction, and in a quite recent book Matthews (26) pointed out that it was very strange that the nucleic acids, the constituents of the cell-nuclei and the presumable 'carriers' of the hereditary constitution of individuals, had all turned out to be chemically the same. The nucleic acids are, however, united in the body to protein molecules, and this fact gives us perhaps the key of the matter. The class of compounds known as the proteins is indissolubly associated with life, and, together with the fats and the sugars, invariably makes up the material foundation of living organisms. Our knowledge of the constitution of the protein molecule, well reviewed recently by Plimmer (30), Cohn (8), and Jordan Lloyd (20), leads to the view that the number of possible varieties in it may be almost infinite.

The protein molecule is made up of a very large number of smaller units, the amino-acids, and each of these can exist in three modifications, differently constructed in space out of the same number of atoms, and therefore rotating polarized light in different directions. The known amino-acids are about twenty in number, and, existing as they do in three modifications, the number of ways in which they can be combined together to form single protein molecules is immensely large, for at least one hundred amino-acid units are required to build up one protein molecule. The molecule of serum albumen may have at least 350,000 million stereoisomers. In this way we can foresee a kind of biochemical individuality, which well might be the physico-chemical manifestation of what we are accustomed to call mental individuality.

Data concerning the individuation of proteins are indeed already to hand. The monumental work of Reichert and Brown (32) and of Reichert (31) succeeded in showing that the haemoglobins (the protein blood-pigments) of the animal kingdom and the starches of the plant kingdom are quite distinct according to the species from which they are derived. This was a step towards demonstrating chemical differences between individuals. Then the phenomenon of racemization of protein led to some suggestive observations. Dakin and Dudley (9) discovered that by standing in alkali for three weeks proteins would suffer changes in their optical properties, so that subsequent hydrolysis, in showing which amino-acids had been altered, would show which ones had been on the exterior of the molecule and thus give a glimpse of its spatial structure. Dudley and Woodman (11), following this up, found that the protein of the milk of the sheep was quite different to that of the cow. It has since been found that the blood-proteins differ as between the sexes, and that there are marked individual differences.

The whole tendency of biochemistry hitherto has been to abolish the influence of the individual by taking in any given estimation as many single animals as possible, and thus getting the average figure. In the future a tremendous amount of work will have to be devoted to ascertaining the magnitude and extent of individual differences and their correlation with mental characteristics. Whether the approach to the problem of biochemical individuation will lie along the lines I have suggested, is not sure, but that it will come there can be no doubt.

When some definite knowledge on this point has been achieved the time will be ripe for investigating the possible physical means by which individuals can affect one another. It will then be well to recall certain facts known to-day, but as yet isolated. The extreme delicacy of human perceptions of odour, for instance, is not at present generally recognized. Zwaardemaker (41) who has devoted much time to this aspect of biochemistry states that when only a few molecules of some odoriferous substances, such as the artificial musks, the nitrobenzenes, are present in a whole room, the characteristic smell is yet perceptible. There is therefore every likelihood that other substances, produced perhaps in the course of metabolism, may, though odourless and not perceived by any of the special senses, exert an influence of one organism upon another. The exceedingly minute is now a familiar matter to the physiologist. The infinitesimal amount of vitamine required to maintain a living body in working order (Funk, 13), the faint trace of iron necessary for biological oxidations—one ten-thousandth of a milligramme—(Harrison, 16), the almost infinitely small quantity of copper capable of killing plant cells placed in water containing it—one in seventy-seven millions—(Nägeli, 27), and the incredible dilution to which certain toxic substances may be subjected while retaining their power (White and Avery, 39): all these instances go to induce an attitude of being surprised at nothing.

Such exceedingly small amounts of chemical substance acting in the individual body have been already much investigated, and even the purest of metaphysicians can hardly have avoided hearing of the name 'hormone'. I need not dilate upon the extraordinarily profound effects which the glands of internal secretion exert upon the mind and the body; they are already sufficiently well-known. The administration of the active principle of the thyroid gland, for instance, can transform certain types of idiots into normal people in a very few days, and the association between adrenalin and fear is as well marked as anything in physiology. The work of Cannon (7), though it has been much criticized (see Stewart, 35), has shown that the emotion of fear is associated with liberation of adrenalin from the suprarenal gland, and with a consequent rise in blood-sugar, presumably—if for a debased moment we may allow ourselves to be teleological—to provide for a better functioning of the muscles in the expected fight. The phenomenon of emotional glycosuria is closely connected with this.

In the discussion of such mechanisms the James-Lange (17-18) theory of the emotions is usually introduced, according to which " sorrow becomes our consciousness of the fact that we are crying ", and we feel afraid because our adrenal glands are secreting an excess of adrenalin. Sherrington (34), reporting experiments involving spinal and vagal transections in dogs, considers that they tended to disprove the James-Lange theory; but this is not yet settled.

This hypothesis, which I should immediately reject if it claimed to have any philosophical value, I can nevertheless admit as being reasonable within the closed circle and limited outlook of the scientific or mechanistic conception of life. I may find it useful to think in physiology AS IF it were true. Joad (19) in criticizing it from a general standpoint is wide of the mark. He points out that fear imperceptibly shades into all sorts of other emotions, and " since the fear gland will not fill the bill, we have to invoke the excretions of some other gland ". Now this is not in the least necessary, for apart from the considerable number of modifications which the adrenalin molecule itself may present, the number of possible combinations with other hormones and other substances is innumerable—or rather, let us hope for the sake of our biochemical successors, almost innumerable. The constitution of what Lloyd Morgan (23) speaks of as the " biochemical brew " is really susceptible of a very great number of modifications, and the physico-chemical expression of the emotions may originate in varying percentage relationships of the hormones of the body.

But it would be quite speculative and fanciful to pursue this subject further; we must keep close to the facts. Let there simply be queried, as Francis Bacon would have said, whether there may not be hormones acting outside the body as well as the well-known ones acting within it, and let us remember that air is no inconvenient medium for the transmission of discrete molecules, altogether apart from radiation, of the possibilities of which I have not spoken at all. It may be noted that to stick close to the facts will be to treat with great caution the work of writers such as Berman (4) who, with their hormonic personalities and pluriglandular horoscopes of Julius Caesar and Madame de Maintenon, do little service to sound physiology.

The investigation of lunacy is another field as yet little touched by the chemist, but offering him vast possibilities. Pathology has often afforded the student of normal living processes valuable illumination, and lunacy will in the future be a good case of this. At the same time there are numerous difficulties attending such work, the chief one being that there are very few diseases entirely mental; most of them have some obvious accompanying physical defect. Thus persons suffering from melancholia are usually very constipated, and this explains the presence of indican in their urine, which at one time was considered to have some relation to their mental state (Townsend, 36). It is much more likely, as Borden (5) showed, to be due to simple autointoxication. Then there was the work of Halliburton (15) on the presence of abnormal amounts of choline in the cerebro-spinal fluid of lunatics. This substance, which would be expected to be produced by a breakdown of brain-lecithin, seemed to occur in several abnormal mental conditions. It is still not certain, however, whether the tests used were really reliable. A similar chemical abnormality was reported by Weinberg (38) who found dementia praecox and melancholia to be characterized by disturbances in the creatinine coefficient. Subsequent investigations (Needham and McCarthy, 28), altogether failed to confirm this finding, and it seemed as if disturbances of creatinine metabolism, when they occurred, could always be related to disturbances of muscular tone, such as are found in catatonia and flexibilitas cerea.

The great trouble in the past about chemical investigations in lunacy has been the lack of sufficiently delicate estimation-methods. Barnes (44) has well reviewed the earlier work. But there is no reason for abandoning hope and assenting to the subtle pessimism of the remark that " chemists have wearied of fishing in distilled water for the chemical causes of mental disease ". Our knowledge of the colloid state has yet to be brought to bear on these problems.

Really definite relationships between chemical abnormalities and mental diseases came to light through the work of Waldemar Koch (21). His principal conclusion, the result of a statistical study of brain material requiring extraordinarily tedious and difficult methods, was that in the brains of persons suffering from dementia praecox the amount and distribution of the phosphorus showed no marked change, but the neutral sulphur was greatly diminished and the inorganic and protein sulphur was slightly high. Pighini (29), it is interesting to note, observed in this disease an increase in the neutral sulphur of the urine. In the case of general paralysis, on the other hand, there was no such dimunition of the neutral sulphur, and indeed practically no difference at all as against normal brains, except that a tendency showed itself for the lipoid phosphorus to be decreased. Work like that of Koch was carried out by Lorrain-Smith and Mair (45) who found in hemiplegic brains a low cerebroside content, much less phosphorus than normal, and a great amount of cholesterol in the form of its esters. In general paralysis, on the other hand, they observed a normal cholesterol content, while the phosphorus and cerebroside fractions were abnormally reduced. McArthur and Doisy (46) confirmed Lorrain-Smith's results in the latter disease. Feigl (12) discovered large variations from normal in the lipoid phosphorus of the blood in general paralysis.

Uyematsu and Soda (47) investigated the blood of patients suffering from catatonic dementia praecox; 75% had a very low uric acid content, and the blood sugar of 47% was high. But their important finding was that the average deviation of every single case was much higher than normal, clearly demonstrating an instability of metabolism. Looney (48) obtained similar results in mania and involutional melancholia with reference to the amino-nitrogen of the blood.

It would be wrong to disguise the fact that even the excellent work of Koch rests only on a comparatively limited number of analyses, and that until statistical studies on really varied material are undertaken, we shall not be able to lay great weight on them. At the same time, they are at present the most suggestive observations we have, and it is not rash to expect that a great variety of others like them will be made in the future.

The question of the physical results of mental activity has so far not been much worked at. That a close correlation exists between mental and cerebral processes was well realized by the physiologists of the early nineteenth century, among whom was born the proverbial phrase, "Ohne Phosphor keine Gedanke", generally ascribed to Moleschott. Lavoisier (22) in 1789 had indeed said, "On peut connaître, par example, à combien de livres en poids répondent les efforts d'un homme qui récite un discours, d'un musicien qui joue un instrument. On pourrait même évaluer ce qu'il y a de méchanique dans le travail du philosophe qui réflechit, de l'homme de lettres qui écrit, du musicien qui compose."

But it was necessary to wait for the era of exact calorimetrical researches before definite information became available. The early work of Atwater and Benedict seemed to indicate that mental work resulted in no extra consumption of energy. Benedict in 1910 (3) said, "It occurred to me that it might be desirable to study the metabolism of students during the mid-year examination period, for if there is any time in which a college student performs mental work, it is then. So it was arranged for students to take their examinations in the respiration chamber." The results of these experiments were altogether negative, in other words, there was no difference between periods of intense mental activity and quiescent periods, as far as estimations of heat, oxygen, and carbon dioxide could show. It was possible, however, to hold that with improved and more delicate methods the doubtless exceedingly slight effects of mental exercise on metabolism would become measurable. In 1914 Becker and Olsen (1) published a great deal of careful work on the subject, which they went into very thoroughly. Their conclusion was that "during the getting by heart of meaningless syllables, an increase of the organic elimination of carbon dioxide occurred, the main part of which was due to the psycho-physiological processes upon which the association work depends. The magnitude of this metabolic increase oscillates parallel with the subjectively estimated amount of work performed. The increase will gradually diminish in amount according as the subject acquires greater practice in the work in question. The respiration of the subject resting, but awake, has a wavy course, but on entrance into sleep the respiratory level is lowered and takes on a constant level value. The cause of the oscillations during waking time, must partly be sought in changing states of consciousness." The conclusions of Becker and Olsen have recently been confirmed by Chlopin and Okuneffski (50).

Very recently Suk (43) has succeeded in demonstrating a very definite effect of prolonged severe mental work upon the blood-sugar level, and Liebermann (42) has reopened the question of the mechanical equivalent of mental work. He made certain calculations from the work of Alexander and Cserna (49) who had perfused the brain in a state of narcosis and also when normal, and he obtained the following figures. A man weighing 67 kg. produces 34 calories per hour: the brain therefore, 1·2 calories per hour, the mechanical equivalent of which is 512 mkg. In narcosis this value would fall to 80% of its former magnitude, so that 410 mkg. would then be produced by the brain, a difference of 102 mkg., most of which would presumably be accounted for by mental work. These experiments and calculations are, however, open to various biochemical criticisims.

Not a few biochemists, impressed by the similarity between mental processes and some physical ones, have suggested physico-chemical interpretations of such phenomena as those of memory. Brailsford Robertson, for instance (33) has made a great deal of the parallelism between the process of volition and an autocatalytic reaction, i.e. a chemical change which moves faster as it goes on, since its own products accelerate it. He has also compared the fading of memory traces with the curves yielded by certain colloidal systems, such as the rate of extraction of protamine from dried spermatozoa by hydrochloric acid. Matthews (26) has also speculated along these lines. In discussing the behaviour of quick-drying oil, he says, " We do not generally speak of the long latent period of the oxidation as a period of teaching, but we call it a period of inductance ; and we do not say that the oil is learning to oxidize itself and doing it better and better, but we say that it shows the phenomenon of autocatalysis ; nor do we say that it forgets again in the dark, but that the intermediary autocatalytic agent has disappeared. But when living organisms show the same kind of phenomena, we speak of teaching, latent periods, stupidity, good and bad memories." That is indeed an excellent instance of the way in which special language is created to deal with the phenomena of life, without any particular reason except lack of courage in the application of the scientific method.

At the same time these suggestions do not rest upon a very secureexperimental basis, and what is more, they are conceptions brought in from outside, as it were, to explain mental phenomena mechanistically. It is more interesting when a certain mental state or activity is directly described in physico-chemical terms, rather than by means of a physico-chemical analogy. These suggestions in a way resemble the well known *simulacra vitae*, of which more examples seem to be discovered every day. Combinations of oil drops with acids may be made to exhibit most of the phenomena shown by the protozoa, the mechanical beetle of Lotka (24) never falls off the table, the Robot chess-player of Torres y Quevedo (37) is rarely in error, and as for the automatic telephone operator (2) it is difficult to see how anything more perfect could be designed as a substitute for human intelligence. But the fact that these imitations of life function so well does not prove that their mechanisms are the same as those of the living brain, it only suggests that; and therefore physico-chemical hypotheses derived from actual physiological data are the more interesting.

It is, I think, unwise to suppose that the forward march of the mechanistic conception of life can be arrested even at the confines of the mind. All the warning notices which have been raised in the past exhorting the biochemist not to trespass have gone down before the flood, and I do not see any chance of new ones being more secure. We must in the future expect that an ever-increasing number of mental phenomena will receive satisfactory treatment in physico-chemical terms, but there is nothing at all for the philosopher or the theologian to regret in this. To be a mechanist in biology is an absolutely different matter from being a realist in metaphysics or that very out-of-date phenomenon, a scientific naturalist. Mechanism in biology, it seems to me, is perfectly compatible with any philosophical standpoint from that of Berkeley or Epicurus to that of Plotinus or William James. For it is a scientific attitude, a scientific concept, and the attitudes and concepts of science are not the only ones which we adopt as men. The philosopher and the poet have other access to truth, and what they say must also be taken into account in our more macrocosmical imaginations. Mechanism, the determinism of science, is universal and partial, and this the Neo-mechanist well realizes. And Lucretius, who through these regions has so well guided us, leaves upon our ears as he departs, those immortal lines of his, foreshadowing, it might seem, the clear physico-chemical knowledge of the organic, no less than the inorganic, world ; and perhaps in their ending reminding us of the power and control over living matter in all its parts, which such knowledge never fails to bring with it.

> " Nobis est ratio, solis lunaeque meatus
> qua fiant ratione, et qua vi quaeque gerantur
> in terris, tum cum primis ratione sagaci
> unde anima atque animi constet natura videndum
> et quae res nobis vigilantibus obvia mentes
> terrificet morbo adfectis somno sepultis
> cernere uti videamur eos audireque coram
> morte obita quorum tellus amplectitur ossa."[1]

Thus so long ago did he set forth his programme, and we claim it also for ours.

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[1] "Then be it ours, with steady mind to grasp
The purport of the skies, the law behind
The wandering courses of the sun and moon;
The powers that govern every living thing.
But most, to see, with reasonable eyes
Of what the mind, of what the soul is made,
And what it is, in sickness or in sleep,
That makes us rise in terror and think we see
Dead men whose bones Earth bosomed long ago."

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SPEAKING OF RESISTANCES[1]

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The chief inconsistency in our psycho-analytic basis is the lack of a broad biological definition of what that basis is. In the absence of such a definition there is lacking on our own part a clear concept of our own basis. In this situation a helter-skelter vernacular has come to take the place of sober formulations such as should stand for a scientifically accepted concept, and with this loose tendency in our basic conceptual usage our psyco-analytic superstructure must necessarily be loose also.

The basis of psycho-analysis is the individual's resistance, and an entire system of psychology has been built around this phenomenon of resistance. But just what a resistance is biologically we have not yet inquired. In response to this question we psychoanalysts have, in effect, merely replied: " A resistance is an objection to my interpretation of your reaction." This is certainly not a position calculated to give edification to our scientific confréres in other fields of biological investigation; for in this position we advocate a system of psychology based upon presumably definite elements, although upon inquiry, it turns out that we have never yet thought it necessary to define in clear, biological terms what these elements are.[2] This quite esoteric, non-biological definition of a resistance is, I think, inseparable from our present individualistic and uncontrolled basis of interpretation. The private, individualistic basis is, it seems to me, necessarily unbiological, and yet this position represents in the present stage of our psycho-analytic evolution the position of us all. We may not like this. It may cause us to feel very uncomfortable, but the fact remains that this circumstance is significant, and that as psycho-analysts it becomes our special function to analyze the significance of just such lapses in our own mental processes. For it is only too apparent that in not defining a resistance we have been ourselves the dupes of the very resistances which it was our business to define.

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[1] In its original form this paper was read as an address before the Sixteenth Annual Meeting of The American Psycho-analytic Association, New York City, June 10, 1926.

[2] Some months ago there appeared in one of our popular magazines an article purporting to be an authoritative repudiation of the method of psycho-analysis by a former advocate of it. This statement, however, was anonymous, and an anonymous contribution in the sphere of the subjective sciences is by its nature scientifically untrustworthy. The objection so popularly felt that there is something essentially unsound in the system of psycho-analysis has doubtless its warrant in certain structural lapses within that system. The fact is, there is something in the psycho-analytic position that is decidedly

Consistent with this scientific *faux pas*, there is among us the prevailing notion that there exists some inherent relation between an attitude of resistance and an attitude of antagonism. This view has its correlate in the contrary assumption that an attitude of acquiescence and mutual endorsement is somehow *not* a resistance. In fact, as we all know, despite our naïve protests to the contrary, we unconsciously make it our business to induce in our patients precisely this attitude of acquiescence and conformity, and this we label 'the overcoming of resistances'. When in his mental imagery toward the analyst the attitude of the patient is one of trusting devotion, the analysis is going nicely. The mental attitude of such a patient is: "I will tell you of my sexual inadvertences, fanciful or actual, because you alone are so understanding, so sympathetic, so wise and good and what-not, that I can confide in you." It is this attitude that we commonly presume is not a resistance. But thereby hangs a tale.

In a less personal, less individualistic interpretation of resistances, I think we must come to see that biologically a resistance is based upon the artificial situation prevailing under a system of social images in which the family album, so to speak, is the unit—a social system which arbitrarily subjects the individual to the parent as a mere sadistic *image* of authority.[1] Like the

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unscientific, and there is definite need of its scientific reconstruction. But pointing the finger at this situation, being critical of it, and holding oneself superior toward it—and especially where it is done behind the screen of anonymity—is not to the point, and will avail us nothing.

As one of those questionable beings known as a psycho-analyst and possessing the vantage ground of a long experience in the use of that method, I feel in some measure qualified to speak of the very grave defects of the psychoanalytic basis as now applied, without in any sense discrediting its scientific possibilities, or for a moment disdaining the Freudian formulation as offering a position that cannot be, with proper scientific controls, adequately met and adjusted.

[1] "Social Images versus Reality", a paper read at the Fourteenth Annual Meeting of the American Psychopathological Association, Philadelphia, Pa., June 7, 1924; *The Journal of Abnormal Psychology and Social Psychology*, Vol. XIX, No. 3, October-December, 1924.

parent who prefers the docile child, we analysts have failed to see that childish docility is but the necessary and opposite reaction to this parental sadism, and that the patient who is acquiescent to this parental image is no less resistant, in his intrinsic organism, than the patient whose reaction takes the counter-sadistic form of antagonism. It is my position, therefore, that organically the the individual's subservience to this individualistic image-authority —it matters not whether it take the form of acquiescence or opposition—is equally a resistance from the viewpoint of his biological integrity, that is to say, of his relation to the species as a whole.

In the analytic situation, of course, there is rehashed the family situation once more. Like the patient of the hypnotist of old, if he 'comes under readily' he is a good and docile subject —that is to say, he is a good subject from the point of view of the image- or transference-authority now vested in the person of the analyst. But my point is that subordination to an image-authority, be it parent or analyst, as definitely involves a resistance as the attitude which opposes this image subjugation.

Were there not present an inherent resistance in this benign and seemingly harmonius filial situation with its note of loving submission, how does it happen that, after many years of such gentle *rapprochement* between a father and son, let us say, some stimulus such as a money conflict or an inept marriage can cause two such people to fly apart in violent and lifelong antagonism one to the other? Is it not apparent that the resistances were already there when so arbitrary an occasion can provide tinder for so violent an outbreak? If the family is really united in so great a love, as we say, why could it not brook this momentary interruption to the habitual tenor of its ways? Or if the proverbially absorbing devotion of the newly married pair is so deep and real, how does it happen that its ardour is so soon dampened? How does it happen that it so soon cools into indifference or even aversion? It is, I maintain, because love (I mean by that the unconscious manifestation we are wont to call love in our present purblind narcissistic interpretation of it) is itself man's major resistance. If this is so, we are merely hoodwinking ourselves when we apotheosize this most naïve of our human frailties and fail to see that in it lies the very essence of our human resistances.

It must be clear that there is some serious unconscious factor operative within us, that we could all this while have been so taken in by our popular personal and social interpretations of love. It must be clear that it is our own social involvement in our own socially involved family images that has permitted us all this time to regard a resistance as something opposed to our own interpretation, and not to have seen that our own interpretation is likewise a resistance. It is only on the ground of our own naïve family images that we can account at all for our having failed to demand of ourselves long ago a sound biological definition of a resistance. This individualistic or family *naïveté* is truly a significant commentary upon our own family or individualistic basis of analysis.

Now whether we like this or do not like it, as I have said, it is certainly very interesting. I, for one, frankly confess that I do not like it. It is an imputation that I find extremely uncomfortable. Nevertheless, it does interest me. In fact, it quite fascinates me to find myself one of a group of scientists advocating a system of psychology that is based implicitly upon a resistance, when it has never occurred to us to inquire what is the biological nature of this phenomenon called a ' resistance '. Humiliating as this circumstance may be for us individually, yet from a more inclusive basis I think it is not impossible for us to derive quite a deep satisfaction in the attempt to account honestly for this extraordinary phenomenon occurring within our own mental processes. I venture to say that we not only do not know what a resistance is, but that we have not the ghost of an idea to whom or what the resistance is. The situation is really too naïve. The Freudian says : " The resistance is to me and to my system." But the Pope says the same thing. So does Mrs. Eddy. And so do you and I. Now, if you press Mrs. Eddy or the Pope, they will tell you that the authority with which they are vested is a divine authority, that the authenticity of their interpretations has descended upon them by special process from an Almighty Providence.

I venture to submit the proposition that, in the private capacity of interpretation claimed by Freud and by you and by me, the authority for our interpretations rests upon as unwarranted and as wholly gratuitous an *image* of private privilege as that of Mrs. Eddy or the Pope.[1] Again I do not like this. I feel sure that you do not. Unquestionably it reflects upon our mental processes, if it can really be shown that all this while we have been chasing a will-o'-the-wisp in what we have called the authority of our interpretations, in contradistinction to what we have been claiming are the incorrigible resistances of other people. Nevertheless, I find myself completely captivated by the absurd spectacle of my own presumptions and quite unaccountably incited to investigate the matter. What gives yet keener zest to this situation is the recognition that the position of Mrs. Eddy, the Pope, and you and me is not peculiar at all to the systems advocated by the devotees of these systems, namely, by ourselves. Not at all. For all these incorrigible folk who, we say, have resistances to us on the basis of our interpretations—that is to say, who object to our interpretations of their reactions—claim no less stoutly and, as far as I can see, with no less authority, that we have resistances to them because we object to *their* interpretations of *our* reactions. So that this phenomenon of resistance would seem to be the reaction of every individual to every other individual, and in each it would seem to consist in the claim to an indisputable prerogative in judging the reactions of others. This phenomenon of resistance would, then, appear to be a socially universal reaction ; and accordingly its biological meaning becomes, I think, an investigation that is the more imperative for us.[1]

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[1] " Psycho-analytic Improvisations and the Personal Equation ", paper read at the Fifteenth Annual Meeting of The American Psycho-analytic Association, Richmond, Va., May 12, 1925 ; *The Psycho-analytic Review*, Vol. XIII, No. 2, April, 1926.

Setting out from the basis of a laboratory consensus, I should like to attempt tentatively to define resistance as a social phenomenon due to the universal presence among us of spurious (transference) social images, and to the compulsion on the part of each individual or collection of individuals to enforce upon all other individuals an authority that is arbitrarily *vested* in him by virtue of his original image of the parent. That is to say, an authority that is not based upon observable facts, but that rests its sole claim upon the personal or social image.[2]

A social group represented by our own psycho-analytic unit or family affords a conspicuous instance of this factor of social resistances. As we all recall, Jung was, in the beginning, the very apple of Freud's eye. In Freud's album of cherished images, Jung was unquestionably the scion of the family. But Jung found himself unable to accept the interpretations of Freud. He had interpretations of his own which he liked better. Likewise Adler, Stekel, Wittels, and others. True to form, Jung and the rest say that it is the Freudian who has resistances to *them*. And, for the life of me, I cannot see that their claim rests upon any less demonstrable authority than that of the Freudian who in turn says: " Not at all, it is they who have resistances to *me*." Could anything be more typical of a family squabble ? Could anything more clearly illustrate the absence of a scientific definition or basis determining just what a resistance is?

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[1] " Our Mass Neurosis ", paper read at the Fourteenth Annual Meeting of The American Psycho-analytic Association, Atlantic City, N.J., June 3, 1924 ; *The Psychological Bulletin*, Vol. XXIII, No. 6, June, 1926.

[2] " The Heroic Role—An Historical Retrospect ", paper read before the Section of Historical and Cultural Medicine of the New York Academy of Medicine, March 26, 1925 ; *Psyche*, Vol. VII, No. 1, July, 1926.

Now it is obvious that in this situation our only solution would be to take sides with one or the other faction, that is, with the father or with our errant brothers. But what has science to do with taking sides with the private prejudice or private interpretations of any individual or collection of individuals? We do not have sides or resistances elsewhere in the sphere of biology. We do not hear one bacteriologist talking about the resistances that another bacteriologist has to his interpretations. And why? Because the bacteriologist does not reserve to himself the privilege of having private interpretations. Faithful to scientific traditions, the bacteriologist submits material to a consensus of observers, and that consensus and the biological sense-perceptions shared by them commonly constitute the inherent authority determining the facts before them.[1] There is no place for autocratic presumption —no possible chance that observation shall be arbitrary because of any influence upon our evaluations of a private or esoteric prerogative.

This muddle, occasioned through our not having defined the very first principles upon which our whole system of psychoanalysis reposes, necessarily occasions a very difficult situation for our confiding patients, as indeed for a naïve and confiding community at large.[2] In our present position the practical quesion is simply, has or has not a patient insuperable resistances to my interpretation of him? And the only earthly way to discover is to subject the patient to my interpretations. Very nice for me, but what about the patient? Such an ultimatum may be clever and it may even be useful, but by no stretch of the imagination could we call this type of legislation scientific or sound. Yet this is the test to which the patient is arbitrarily subjected: has he resistances to me or has he not?

As we know, there exists an infallible test for determining whether certain fungi, presumed to be mushrooms, are or are not poisonous

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[1] " Psychiatry as an Objective Science ", paper read at the Fifteenth Annual Meeting of The American Psychopathological Association, Washington, D. C., May 7, 1925; *The British Journal of Medical Psychology*, Vol. V, Part 4, 1925. " The Laboratory Method in Psycho-analysis ", paper read at the Ninth Congress of the International Psycho-analytical Association, Bad Homburg, Germany, September, 1925; *The American Journal of Psychiatry*, Vol. V, No. 3, January, 1926. " The Group Method of Analysis ", paper read before the Washington Psycho-analytic Society, November, 14, 1925; to be published in a forthcoming issue of *The Psycho-analytic Review*; " Die Gruppenmethode in der Psychoanalyse ", *Imago*, Band XII, 1926, Heft 2/3.

[2] " Our Social Evasion ", Presidential Address before the mid-year meeting of The American Psycho-analytic Association, New York City, December 27, 1925; *Medical Journal and Record*, Vol. CXIII, No. 12, June 16, 1926.

—namely, to eat them. But however decisive this test, it can hardly be called scientific, because as many times as not the investigator succumbs in the process of his investigation. Such a test, it seems to me, is identical with that of the patient approaching the psycho-analyst who cherishes a private basis of interpretation. Does the personality of the patient agree with that of the analyst? Can he accept, can or can he not assimilate the analyst's interpretation of him? If he can, well and good. If not, the patient is in a sorry pass, and as often as not must either accept permanent invalidism, insanity, or suicide. Beyond question this is a most decisive test as regards the fitness of the analytic diet for the particular patient, but, like the test of mushrooms, it is had at a high cost to human life.

These reflections lead me to feel the complete inadequacy of an analytic technique that artificially separates the individual patient from his natural soil or social setting. An analysis that does not take into account the resistances that are manifested socially toward the patient as well as the resistances he manifests toward others includes but half of the picture. Our resistances are social. An observation that takes account only of the individual's reactions and leaves out of reckoning the interreactions existing between him and his social environment is necessarily biased and one-sided. Our resistances are physiological. To interpret this phenomenon apart from its neural biology is to talk in the air, and again we have reverted to the arbitrary prerogative of the religionists. My position is that, in our own resistances, we have not yet sensed the social and physiological value of a procedure that retains intact the physiological and social conditions of the organism. In our failure to recognize the biology of resistances and their social physiology we have been labouring under a misapprehension, and our private method of analysis has necessarily been hampered in its efficiency in the measure in which we have been restricted to its personal and exclusive use. A modification of the private analysis and its supplementing with a social or group basis of technique will, I think, be found to constitute the only logical—because it is the only physiological—condition of observation competent to cope with civilization's pandemic of resistances.

It does seem to me that it is clearly time that this organization cease to point out the resistance as though it were something outside and opposite itself, and that we realize that our problem is a social one in which we are all participants in a social *system* of resistances. To look at a patient before me and say that he has resistances because he does not agree with my interpretation of his reactions, is a method that really must go by the board. As one psycho-analyst of more than usually broad perspectives recently wrote me, " this [the private basis of interpretation] refers to a situation from which I have suffered the deepest 'feelings of guilt' over botches in psycho-analysis. And what is the remedy ?" And the writer adds: " A consensus of sincere acceptance of certain objectified results obtained from a group of interested workers."

With individual psycho-analysts awakening more and more to the unsoundness of a basis that is private because it excludes a consensus of co-workers with respect to the data under investigation, it seems to me that psychopathologists generally will be led inevitably to adopt a basis that is as obviously scientific and controlled with respect to data within the mental field as the basis obtaining in respect to data within other spheres of biology.

EMERGENT EVOLUTION AND THE SOCIAL[1]

BY WILLIAM MORTON WHEELER

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When our thinking tends to congeal into two conflicting interpretations we naturally either devote our days to showing why the one must be true and the other false or we seek to escape from both by adopting a new position from which we can view each of the alternatives as a mixture of truth and falsehood. The theory of emergent evolution (Morgan), also called 'evolutionary naturalism' (Sellars), 'creative synthesis' (Spaulding), 'emergent vitalism '(Broad), and 'organicism' (L. J. Henderson), is an example of the latter tendency since it is an endeavor to avoid the 'nothing but' attitude of naturalism *versus* supernaturalism, determinism *versus* freedom, continuity *versus* discontinuity, mechanism *versus* vitalism, the many *versus* the one. It corresponds in philosophy to the resolution of the more special conflict between preformation and epigenesis in embryology. Experimentation on the development of living, and study of the phylogeny of living and extinct organisms have demonstrated that there is both genetic continuity and discontinuity, or the production of novelty in organisms; in other words, that evolution is not only a repetitive but also a creative process. With the increasing tendency to extend the concept of organization, in the sense of the French *agencement*, also to the physical, chemical, psychological, and social domains, there arises a strong probability that the various antitheses above mentioned may be resolved in somewhat the same manner as they have been in biology.

But this as all somewhat vague. A more specific statement, applicable to each empirical instance of novelty, has been formulated by the American and British realists, Holt, Spaulding, Sellars, Alexander, C. Lloyd Morgan, H. C. Brown, Conger, Jennings, Gordon, C. K. Ogden, and G. H. Parker, who maintain that the unique qualitative character of organic wholes is due to the peculiar non-additive relations or interactions among their parts. In other words, the whole is not merely a sum, or resultant, but also an emergent novelty, or creative synthesis. This conception was long ago advanced by J. S. Mill, G. H. Lewes, and Wundt, and since the various sciences are concerned with the investigation of wholes of different degrees of complexity, it is, perhaps, implicit in Comte's hierarchy of the sciences, to which we still adhere, and in our various chemical and biological classifications. According to Spaulding "*certain specific relations* recognized, named and *technically formulated in special sciences, organize* parts into wholes, and there are states of affairs resulting [we should now say 'emerging'] that are identical with new properties, and that are different and distinct from the individual parts and their properties. Therefore the *reduction* of these new properties to those of the parts *in the sense of identification*, and the finding of a *causal determination* also in this same sense is *impossible*. The properties of the whole are, at least some of them, new, and in just this respect *are a 'law unto themselves'* and *in this sense free*. This does not mean that they are lawless, but only that their specific principles of 'behaviour' are not identical with those of the parts."[1] And, paraphrasing the dictum that to be determined by one's own nature is to be free, he adds "*Freedom consists, therefore, of action in accordance with those characteristics which subsist at a certain level of organization* but do not exist at other (lower) levels, yet is quite compatible with law and determination both at this higher level and at lower levels. Freedom of this kind subsists *at each level* of reality in the universe, not only in the mental but also through the physical and the merely subsistant realms." It is perhaps unnecessary to point to the essential similarity between emergence as thus understood and the *Gestalt* of the configurationists, Wertheimer, Köhler, Koffka, Drexler, etc.

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[1] Address given at the sixth International Congress of Philosophy, Division A, Cambridge, Massachusetts, September 14, 1926, and published with its permission.

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[1] This matter has been more fully considered by Broad (p. 77) :—

On the emergent theory we have to reconcile ourselves to much less unity in the external world and a much less intimate connection between the various sciences. At best the external world and the various sciences that deal with it will form a kind of hierarchy. We might if we liked keep the view that there is only one kind of stuff. But we should have to recognize aggregates of various orders. And there would be two fundamentally different types of law, which might be called "intra-ordinal" and "trans-ordinal" respectively. A trans-ordinal law would be one which connects the properties of aggregates of adjacent orders. A and B would be adjacent, and in ascending order, if every aggregate of order B is composed of aggregates of order A, and if it has certain properties which no aggregate of order A possesses and which can not be deduced from the A properties and the structure of the B complex by any law of composition which has manifested itself at lower levels. An intra-ordinal law would be one which connects the properties of aggregates of the same order. A trans-ordinal law would be a statement of the irreducible fact that an aggregate composed of aggregates of the next lower order in such and such proportions and arrangements has such and such characteristic and non-deducible properties. If we consider the properties of a given aggregate of high order we could then divide them into three classes. (1) Those which are characteristic of this order, in the sense that all aggregates of the order possess them, that no aggregate of lower order does so, and that they can not be deduced from the structure of the aggregate and the properties of its constituents by any law of composition which has manifested itself in lower orders. These might be called the "ultimate characteristics" of the order. (2) Those which are characteristic of this order; but which could in theory be deduced from the structure of the aggregate, the properties of its constituents, and certain laws of composition which have manifested themselves in lower orders. These might be called "reducible characteristics" of the order. (3) Properties which aggregates of this order share with those of lower orders. These might be called "ordinally neutral properties".

There is evidently danger of conceiving the emergents in a fashion too schematic, too rigid, and too static. The whole constituted by the organized and integrated parts need not be regarded as novel in its entirety. The novelty is variable and may be evident only in certain functional aspects of the whole. Since wholes have a manifest cumulative tendency to combine and recombine to form ever more complicated wholes, the ascending hierarchy of emergents has been much stressed. It is far from being universal, however. By loss or simplification of parts or suspension of some of their interactions, there is also an *Abbau*, or unbuilding, productive of simpler emergents. This is clearly seen in the many recessive mutations of plants and animals and in the numerous secondary simplifications in such forms as parasites and other highly specialized organisms which are demonstrably descended from more complicated and nevertheless more primitive and generalized ancestors. There is, therefore, an evolution by atrophy as well as an evolution by increasing complication,and both processes may be going on simultaneously and at varying rates in the same organism. We must also remember that most authors artificially isolate the emergent whole and fail to emphasize the fact that its parts have important relations, not only with one another, but also with the environment, and that these external relations may contribute effectively towards producing both the whole and its novelty. This tendency to abstraction has led Professor H. C. Brown to remark that " the whole is then physically more than the sum of the parts *we have taken account of*, although these may be legitimately abstracted as sufficient for correlation with the consequences of the integration. The extraordinary sense of mystery some seem to feel about the process seems to me to arise from forgetting this interstitial filling that is as real as the selected elements and renders technically false the literal interpretation of the appealing paradox of the whole that is something more than the sum of its parts."

If all wholes of which the parts are organized, or exhibit those relations which we call integration, differentiation (' division of labor '), interactive accumulation, etc. among themselves and with the environment, are emergents, we must agree with Morgan that " it is beyond the wit of man to number the instances of emergence ". Since no two events are identical, every atom, molecule, organism, personality, and society is an emergent and, at least to some extent, a novelty. And these emergents are concatenated in such a way as to form vast ramifying systems, only certain ideal sections of which seem to have elicited the attention of philosophers owing to their avowedly anthropocentric and anthropodoxic interests. These sections have been called levels. The word is not very apt since it conveys a spacial and static metaphor, whereas emergents must be regarded as intensively manifold spacio-temporal events. Naturally no two authors agree in their lists of levels. Metaphysicians and epistemologists like Alexander and Morgan are mainly interested in space-time, matter, life, mind, and deity as successive emergent levels. To the biochemist, biophysicist, biologist, and physiological psychologist, however, life and mind are so amazingly complex and comprise so many heterogeneous processes that their blanket designation as two emergent levels can not seem very illuminating, and to the observer who contemplates the profuse and unabated emergence of idiots, morons, lunatics, criminals, and parasites in our midst, Alexander's prospect of the emergence of deity is about as imminent as the Greek Kalends.

Our knowledge of organisms and their development will hardly permit us to accept such levels as life and mind as having been established *uno icto*. Emergence must be more ambulatory, or at any rate less saltatory. If the naturalist is to accept both genetic continuity and novelty in evolution, the viable novelty at each emergence must be very small indeed.[1] This is attested both by the extraordinary slowness of phylogeny and the very subtle transitions in even the most rapid ontogenies. Even metamorphosis in organisms is only superficially saltatory. Novelties such as life and mind, conceived in wholesale fashion, are of such magnitude that we can regard then only as representing the final accumulative stages of very long series of minimal emergences. The insistence on levels becomes, therefore, largely a matter of descriptive emphasis and should not conceal the necessity for detailed scientific knowledge of every emergence and the peculiar constellations and interactions of the parts which immediately determine it.

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[1] I have used the word ' viable ' intentionally because monsters and other extreme unadapted mutations are also emergents.

One of the levels in which the situation, as it appears to me, is most open to investigation, is the social. Unfortunately the subject has been passed over by writers on levels with only a few vague remarks. Unfortunately, also, the science of comparative sociology has remained undeveloped. It has, in fact, fallen between two stools, because the sociologists have left the study of animal and plant societies to the biologists and the latter have been much less interested in these societies as such than in the structure or individual activities of their members. Apart from Forel and myself only a few investigators, like Espinas, Waxweiler, Petrucci, and Deegener, have evinced a keen interest in non-human societies. Yet these, no less than human society, are as super-organisms obviously true emergents, in which whole organisms function as the interacting determining parts. Owing, moreover, to the loose and primitive character of the integration and the size of the components even in the densest societies, it is possible to ascertain the behaviour of the parts and to experiment with them more extensively than with chemical and organismal wholes, since the parts of the latter are either microscopic or ultramicroscopic and are always so compactly integrated that analysis becomes very difficult and involves a considerable amount of statistical inference. Experiments in subdividing, compounding, castrating, and grafting, and in introducing foreign elements with a view to observing their effects on animal and plant societies as emergent wholes, can be carried far beyond the limits of such experiments on the single living organism. For this reason, for the reason that there is a much greater wealth of emergents at the social level than is commonly supposed, and because the peculiarities of social emergence bear an interesting analogy to those of mind, you will pardon me if I descend to a rapid review of a number of biosociological details.

Social aggregates—if we employ the term ' social ' in its broadest sense—may be divided into two great groups, the heterogeneous and the homogeneous, the former comprising the associations of organisms belonging to different species, the latter of individuals of the same species and therefore of common genetic origin. In either group the simplest association obviously obtains between two interacting individuals, the combined behaviour of which may be said to form an emergent pattern different from, though depending on, the functional peculiarities of the two component organisms. Among the heterogenous associations we can distinguish the innumerable cases of predatism, parasitism, symbiosis, and biocœnosis, which constitute a vast series of emergents varying from those of very low to those of very high integration.

In predatism, the predator becomes structurally and behaviouristically adapted to the prey and the latter to the predator, at least to the extent of modifying its habits of flight, concealment, defense, or fecundity. In these cases we can hardly speak of association in the social sense, but it may be noted that if the predatory species indulges in too great an extermination of the prey, it must either adapt itself to some other form of prey or automatically cease to exist. In parasitism this danger is the greater because the association of host and parasite is so close as to be usually one of actual bodily contact. Moreover, the parasitic association which is exhibited, either temporarily or permanently by many thousands of animal and plant species, tends to ever greater definiteness through the selection of specific hosts by the parasites. This type of association is unilaterally aggressive like predatism, but tends in turn to lapse into a relation of mutualism, or symbiosis, between the interacting individuals, again giving rise to innumerable emergents exhibiting such diverse behaviouristic wholes as the helotism of alga and fungus in the lichens, the association of bacteria or *Micorrhiza* with the roots of higher plants, the singular associations of pollinating insects with flowers, between the yeasts or bacteria and the tissues of Homopterous and other insects, between ants and certain tropical trees and shrubs, the cultivation of fungi by beetles, ants, and termites, etc. Finally there are the biocœnoses, or associations of plants and animals that live in particular edaphic situations, such as swamps, deserts, rain-forests, etc.—veritable welters of organisms of many species, all interacting with one another in complex predatory, parasitic, and symbiotic relationships, but forming wholes in which the experienced field-naturalist can readily distinguish general adaptive patterns, though their adequate description may be impossible. In the tropics a single species of tree may harbor and nourish more than a hundred species of insects peculiar to itself, and these may, in turn, be the prey of many predatory insects, reptiles, birds, and mammals, and the hosts of innumerable fungus, protozoan, vermian, and insect parasites. We may truthfully say that there is not on the planet a single animal or plant that does not live as a member of some biocœnose.

True societies are possible only when the components belong to the same species, but the motives of their association may be very diverse. They may be said to belong to three main types according as nutritional, reproductive, or defensive functions predominate in the emergent social behaviour. Examples of the nutritional type are certain Cœlenterates, like the Siphonophores, corals, etc., the tunicates, tapeworms, and the higher vascular plants.

In all these cases the society, or colony, is formed asexually by repeated budding from a single individual and sexual reproduction is restricted to the dissemination of the species and the formation of the initial individual of the colony. Certain members of the colony may be specialized for the purpose of securing food, but this is shared by all the vitally interconnected individuals.

The sexual, or reproductive, type of society is more interesting. It starts with a peculiar temporary co-operation, or mating of only two individuals, the male and the female, and emerges with the growing up of the off-spring in co-operative affiliation with the mother or with both parents. A more or less permanent family is thus formed, which may become very numerous either through the production of successive generations of offspring by the same mother or through the consociation of a number of genetically related mothers and their offspring. This is the type of society which we find among the insects, and I have been able to show that it has emerged at thirty independent points at least during the phylogeny of the class. Some of these colonies are very small and evanescent, or feebly integrated, but others are very stable, comprise many thousands of individuals (ants, honey-bees, social wasps, and termites) and are very highly integrated, with so pronounced a social division of labour among the individuals that definite castes are produced (workers, soldiers etc.) which are not only functionally, but may even be morphologically differentiated at an early stage of their post-embryonic development. Although the formation of the various castes is primarily connected with the functions of nutrition and defense the main activities of the colony center in reproduction, i.e. in producing and rearing as many young as possible. That the social activities may present a very definite emergent pattern is most clearly seen in the nests of bees, wasps, ants, and termites. These structures, though the result of the co-operative labour of most of the personnel of the colony, are nevertheless true *Gestalten*, being no more mere sums of the individual activities than is the diverse architecture of cities built by human hands. Not only does each species have its peculiar type of nest, but the nest of every colony of a species exhibits its own emergent idiosyncrasies.

The situation among the social insects may be complicated in a very interesting manner by the tendency of their colonies to adopt alien insects as guests or nest-mates. This is especially true of the ants and termites. These guests are really social parasites and are to be regarded as component members of the colonies in the same sense as dogs have for ages been effective members of human societies. But in the case of the social insects the behaviour of the guests may produce veritable social diseases in the colonies that harbour them. As a result of their adoption even the structure and numerical proportions of the castes may be modified, although there is a demonstrable effort at social regulation on the part of the host, just as there is in the single organism whose tissues have been invaded by bacteria or other parasites. This tendency to consociation with strange organisms is carried even further in the union of whole colonies of bees, wasps, and ants with colonies of alien species, and in these so-called 'mixed colonies' one of the social components assumes a predatory or parasitic rôle, suppressing the fertile queen, or reproductive organ of the host colony, i.e. indulging in what is known as 'parasitic castration' among single organisms, and controlling the activities of the whole, so that a new emergent arises—a super-superorganism, or superorganism of the second degree.

The defensive colonies are represented by the schools, flocks, herds, and bands of fishes, birds, and mammals, and consist of individuals, sometimes of only one sex or of the young, belonging to different families. While these congregations are usually based on sexual reproduction, their primary social function is nevertheless the protection of the individuals. There is often a vague differentiation of function as in the stationing of sentinels or of more vigorous or more formidable individuals in strategic positions when the herd is feeding or is otherwise exposed to danger. The bands of monkeys, anthropoids, and primitive men constitute loose social aggregates of this pattern. We must, I believe, regard human societies above the level of the primitive savage horde as still higher emergents, i.e. as super-superorganisms which not only have their reproductive bases in the consociation of numerous families, but have developed innumerable groups, or associations, all so inextricably interrelated that a single individual not only has multitudinous relations with the members of his own and other families, but may belong simultaneously to a number of different associations. The total emergent functional pattern is here so amazingly complicated that it altogether defies observation as a whole.[1] Whereas nearly all insect societies possess an ontogeny, since they have their inception in a single fertilized mother queen and exhibit a gradual growth, integration, and differentiation as new individuals are successively added from the eggs of the queen till the colony attains a definite adult stature in a manner analogous to that of the ontogeny of the single organism by division and differentiation of its component cells, human society no longer possesses an ontogenetic stage but grows indefinitely by a kind of interstitial swarming, which resembles that of the honey-bee only when contingents of individuals are sent out as colonies, as occurred in ancient times among the Greeks and Romans and has been the practice of other European nations during more recent centuries.

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[1] Only in certain cases, such as ceremonials and rituals, is it possible to observe emergent social patterns as wholes or *Gestalten*. A fine example of such a pattern, covering a wide area and many activities and carried out by many individuals, though unperceived by the latter, is the *kula* among the natives in the archipelagoes of Melanesian New Guinea as described by Malinowski in his *Argonauts of the Western Pacific*.

Now the various emergents which I have very briefly discussed indicate that there is something fundamentally social in living things, and closer scrutiny shows that this must be a characteristic of all life, since every organism is, at least temporarily, associated with other organisms, even if only with members of the opposite sex and with its parents, and every organism is at least implicated in some biocœnose. This statement holds good even of such supposedly unsocial creatures as lions, eagles, sharks, tiger-beetles, and spiders. There are, in fact, no truly solitary organisms. We may say, therefore, that the social is a correlate as well as an emergent of all life in the sense in which Morgan speaks of mind as being both a correlate and an emergent of life. And like the more complicated mental emergents, such as the instincts and conscious activities, striking social emergents make their appearance sporadically and often in unrelated groups of species, as I have shown among the insects.[1] Indeed, the correlations of the social—using the term in its most general sense—even extend down through the inorganic realm to the very atom with its organization of component electrons. And since reality is given as classes of elements, each represented by innumerable similar active entities, endowed with an irresistible tendency to cohere and organize themselves into more and more complex emergent wholes, association may be regarded as the fundamental condition of emergence. We are, I believe, bound to assume that the organization *is entirely the work of the components themselves* and that it is not initiated and directed by extraspacial and extratemporal ' entelechies ' (Driesch), ' organizatory factors ' (Eldridge), ' deity ' or ' élan vital ' (Bergson). Such agencies are conceived as possessing remarkable foresight, although the whole multimillennial course of evolution with its innumerable *impasses* and *culs-de-sac*, its abject and tragic failures, would seem rather to be one vast monument to their colossal and hesitating inadequacy, blindness, and stupidity. The resort to such metaphysical agencies has been shown to be worse than useless in our dealings with the inorganic world and it is difficult to see how they can be of any greater service in understanding the organic. The tender-minded may still delight in assuming their intervention in the development and maintenance of unicellular and multicellular organisms, whose integration is so exceedingly complicated and opaque that we are probably still centuries removed from any adequate understanding of their functional composition, but on the next level, that of the very loosely organized social, or superorganisms, in which the actual play of the components is open to inspection, it is not so easy to tolerate these ghostly presences.

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[1] This matter is fully discussed in my *Social Life among the Insects*, 1923, and *Les Sociétés d'Insectes, Leur Origine, Leur Evolution*, 1926 (to appear in the " International Library of Psychology " under the title *Insect Societies*).

I fail to understand why Alexander and Morgan select deity as the supervenient level next to mind, since their general scheme of emergent evolution most naturally demands the social as the next level in ascending order. Were prophecy in order we might ask what level may be expected to emerge beyond the social. Perhaps this may be the end of the series, with supervenient extinction, also to be accepted by the race with good cosmic manners, if not with Morgan's " natural piety ". It would seem however, that the present very imperfect state of our society may allow for not a few successive emergents in the form of greater solidarity and higher ethics. But here we touch on a consideration which even Herbert Spencer felt to be ominous. Will this prospective and more intensive socialization be analogous to that of the highest social insects, a condition in which specialization and constraint of the single organism are so extreme that its independant viability is sacrificed to a system of communal bonds, just as happens with the individual cell in the whole organism? Within the groups of social insects, as we pass from the socially primitive to the more specialized, or in the ontogeny of the single colony as we pass from its earlier to its later stages, we actually witness a notable and increasing degeneration of the individual. Holmgren has shown that the supra-œsophageal ganglion or brain in old kings and queens of termites shrinks to one third, while the sympathetic ganglia increase to three times their original size. And von Rosen finds that the eyes and optic ganglia of aged royalty among termites also undergo marked degeneration. Furthermore, the eyes, brain, thoracic structure, and often also the pigmentation of the workers in the most highly socialized ants are less developed than they are in the workers of small primitive societies which are more like the original solitary Vespoid ancestors. There may even be a complete suppression of the worker caste and a return or de-differentiation to what is, to all intents and purposes, a non-social life in certain ants, bees, and wasps (*Anergates*, *Psithyrus*, *Vespa austriaca*, etc.) which behave as parasites in the colonies of other ants, bees, or wasps. We also notice a concomitant degeneration in pigmentation and other structures as we pass from primitive forms like *Mastotermes*, *Archotermopsis*, and *Hodotermes*, with their small colonies, to *Termes* with its huge colonies of highly specialized individuals. Many more examples might be cited, but these will suffice to show that evolution by atrophy certainly accompanies an advance in social integration in the insects. Turning to man we notice a similar regressive development of the individual as civilization proceeds. There is a decline in the sense-organs (witness the number of people with congenital or acquired defects of vision, hearing, and smell), anomalies in the epidermal structures (teeth, hair, and pigmentation), the absence of any demonstrable improvement in the brain cortex and intelligence during historic time (possibly even some deterioration !), the greater activity of the visceral nervous system and endocrine glands as shown by the higher emotivity, increasing insanity, criminality, and mob-psychology in our larger cities, etc. Add to all this the atrophy or subatrophy of our organs and tissues brought about by the ever-increasing specialization in our activities, and we can hardly fail to suspect that the eventual state of human society may be somewhat like that of the social insects—a society of very low intelligence combined with an intense and pugnacious solidarity of the whole. Even the intensification of nationality witnessed in existing human society has its counterpart in the hostility of every colony of social insects towards every other colony, even of the same species. A society of the type towards which we may be drifting might be quite as viable and quite as stable through long periods of time as the societies of ants and termites, provided it maintained a sufficient control of the food supply. Inter-societal hostility undoubtedly has its roots in the mutual hostility of the individuals, both of the cells or tissues of single organisms and of the individual organisms composing superorganisms, and this 'hostile symbiosis' is the foundation on which Morley Roberts has recently erected a very interesting theory of evolution. The primitive predatism and parasitism from which symbiosis has emerged is not lost by the individuals composing organisms or societies, but merely abides in latency, as the most casual observation of our species demonstrates, ready to flare up under certain conditions with the most disastrous results, such as the death of the individual (cancer and other malignant growths and variations), or the dissolution of society (revolution). It follows from such considerations that the optimistic conception of progress as an unceasing process in the human race may be illusory. Roberts suggests that our enlarged fore-brain, the "specific organ of civilization" (C. J. Herrick), with its ninety-two hundred million neurons, of which we are so proud, may really have originated as a malignant over-growth (tumour), and he remarks that "in discussing the factors of evolution objections to our regarding the encroachments of the fore-brain upon the animal function of the human body as perpetual approximations to and recessions from a state of morbid over-growth, on the ground that to this we owe human progress, are wholly irrelevant. Progress, whatever it may be, is obviously relative, and a healthy Neanderthal or Cromagnon man, who might as easily dispose of a modern athlete as any gorilla, could be held excused if he thought his bald and almost jawless successor to be in the highest degree degenerate. There can be no doubt that what we, perhaps in our blindness, call the upward progression of the human race, has always been accompanied, especially when advance seemed most rapid, by an increase in disease, and it would in no way be surprising if we learnt at last that the remarkable increase in the fore-brain was not only one of the causes of malignancy but was to be in the end one great cause of the extinction of man. If that proved to be a fact, such a result would but class man as one of the many races of animals which perished of special over-growths and a possible lack of fertility."[1] The prospect is by no means pleasant. You will be delighted, I am sure, that I refrain from further comment.

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[1] The degenerate or pathological character of civilization has been emphasized by many authors, including Ruskin and Carpenter. The following is from Schiller (*Ueber die ästhetische Erziehung des Menschen*, 1795), and is quoted by Jung in his *Psychological Types*, p. 91: "I do not ignore the advantages which the present generation, regarded as a whole and measured by reason, may boast over what was best in the by-gone world; but it must enter the contest as a compact phalanx and measure itself as whole against whole. What individual modern could enter the lists, man against man, and contest the prize of manhood with an individual Athenian? Whence then arises this unfavourable individual comparison in the face of every advantage from the standpoint of the race?" In the writings of Stärcke ("Psychoanalysis and Psychiatry", *Internat. Journ. Psycho-Anal.* II, 1921, p. 361-415), who actually dubs the disease of civilization 'metaphrenia', I find the following remarks: "Civilization seems then to be a disease which is imposed on a certain portion of society in order to obtain a certain extra gain whereby all profit. . . . Civilization from the individual point of view belongs to neurotic phenomena. . . . We see the civilization of a people or a race built up in cycles according to the mechanisms of the obsessional neurosis, until it becomes no longer bearable; then there comes about a limitation of the useful effect through the return of the repressed material in disguised form, and a breaking through of forbidden things in war and revolution, according to the principles of the manic psychoses, while various 'isms' analogous to the paranoid fields are not lacking. . . . Civilization demands regression," etc.

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GESTALT PSYCHOLOGY IN SPORT[1]

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This paper records a number of psychological observations which I have made while taking part in various sports, and which may prove valuable in theoretical investigations. I have found, by questioning a number of people, that these phenomena are not unique to me, but have also been observed by others. These remarks attempt to apply psychological methods and point out problems in a sphere, which, as far as I am aware, is here examined for the first time from this point of view. This paper, however, by no means pretends to be exhaustive.

I

What, for instance, is the difference between high and long jumping? Are they only different in so far as in the one the athlete tries to jump over a vertical, in the other a horizontal, space? Certainly both are tasks set for the athlete; but for him and for his results it is not a matter of indifference that the high jump is concerned with getting over a *definitely limited* portion of space, while in the long jump there is no such definitely limited portion of space. In high jumping the lath prescribes the magnitude of the performance; the spatial organization here permits us to make certain assertions which do not apply to long jumping. The high-jumper has certain heights which seem to him 'still quite easy'; then he reaches a 'danger zone'; and finally comes to a height which seems to be beyond 'reach', and which he perhaps attempts only because an opponent has succeeded in jumping this height. The aim of the long-jumper, on the other hand, presents itself in quite a different manner, since in his case there is no question of a definitely limited portion of space: there is no object that prescribes the length of his jump. Therefore he hurls himself from the 'take-off' into empty space, using all his force and technique, and trusting all to his good spring and to his posture during the jump. For him every jump in a competition is an attempt at his best performance—which is not at all the case in high jumping. The long-jumper, like the high-jumper, is spurred to greater efforts by the better performances of his opponents; but he lacks that phenomenal representation of these performances which comes to the help of the high-jumper in a similar situation. The expert athlete has found that a phenomenal representation of his goal has a real influence on his performance, and often makes use of this in long jumping by a phenomenal expression of his aim. He does this by putting a prominent mark in the hitherto unorganized jumping space near the point which he must reach, and by trying to attain this mark or exceed it. Only then can we speak of overcoming a portion of space in the same sense as in high jumping.

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[1] This article is an authorized translation by Elisabeth Koffka and Warren Vinton of a paper published in *Psychologische Forschung*, Vol. VII, p. 386.

II

The situation in putting the shot, in throwing the discus, and in throwing the spear is similar to that in long jumping. When putting the shot over short distances it is possible to represent phenomenally the achievement of the opponent or of oneself in an effective manner; but such a phenomenally effective representation is quite impossible in discus or spear throwing. In these also, a knowledge of the opponent's achievement encourages a greater display of force, but knowledge alone lacks the impressiveness which goes with a portion of space marked off phenomenally as ' to be out-done '.

III

Before we take up in detail the quite different conditions in running and sprinting, let us consider the psychology of the spectator. The high-jumper moves the lath up for the decisive test, and goes to the ' take-off '. In a tense expectant silence the eyes of the spectators are fixed on him and his apparatus; no encouraging word breaks into the silence of the concentrated force with which he approaches his task. Only in the moment when the dynamic of the jump is discharged do the spectators recover movement; speech, carefully repressed for fear of disturbing the jumper, is now released for commendation or regret. The tense silent concentration on the jump breaks up into motion. The case is just the opposite in running, especially in sprinting, where the excitement of the public follows the dynamic of the race itself. Words give place to cries, then shouts, becoming sharper and sharper as the decision is fought for in the last few metres before the goal. In this case shouts are no unwelcome disturbance; for the runner, who hears his name, they are a welcome whip. Even in the quieter dynamic of middle-distance and long-distance running, this onsweeping force of the spectators breaks in at decisive moments. No one has to teach them how to behave; they know that the performance of the jumper is best helped by an expectant silence, while that of the runner prospers under encouragement.

IV

Soon after the starter of a cross-country bicycle race sends off the riders on their course, there occurs among the originally unordered mass of riders a certain definitely directed shifting of place, which becomes evident in an 'articulation' on the principle of 'leading and being led'. This shifting is evident to an outside observer as the riders, instead of remaining side by side across the road, fall in one behind the other on a comparatively narrow stretch. The first endeavour of the riders after the start is to bring some order out of the formless mass, and to work out some 'structure' in which each one can take up a definite position, which each one can survey to keep his opponents in sight, and in which, to the best of his ability, he can carry out tactics based on leading and being led, two very different ways of riding. In the beginning it is relatively indifferent to each rider which position he holds in the structure; at this stage of the race the formation of the structure, with its articulation of leaders and led, is more important than the distribution of places inside the structure—although it is, of course, advantageous to be one of the leading group. Here the conditions are quite different from those in short races over a course, where, after the starting signal, the contestants frequently attempt to hold back, since none of them wants to take a position which does not suit him. If, in such a moment of indecision, one of the contestants pushes ahead with a sudden spurt, he may succeed in gaining a head-start before his opponents have decided on the distribution of rôles in the chase, that is, on who shall lead and who be led; this is often decisive when the distance is short. Such surprises on the part of one rider are practically impossible at the beginning of a cross-country bicycle race. The rest of the contestants guard against surprises by a firm articulation, that is, by arranging that changes in the distribution of places may best take place *inside* the structure.

What is the appearance of such an ordered group (as the structure may now be called), and how does it function?

To begin with, let us consider the head of the race which has separated itself from the rest of the riders, and which now strives to maintain its head-start. Observation will generally show that several riders form such a head, in which no one acts on his own account, but rather lends himself to co-operation as one member of a group. The formation of such a head group is often the result of the very first efforts to set up a structure. In these efforts good riders may often fail to join the head, because they are unable to leave their unfavourable positions and get through the weaker riders when the struggle first starts. The struggle to retain the leadership compels the riders in the head to work together, and creates between them a co-operation in opposition to the riders who have fallen behind. The members of the head group are faced with two tasks: the first is to maintain their head-start, this is the urgent task and concerns equally all the members of the group; the second is concerned with the main job of being the winner of the race. The solution of both tasks is found in the right utilization of the advantages offered by leading and being led; for this each member of the group needs the assistance of the others, *and only so can sufficient velocity be secured, together with a certain saving of strength.* Leading is a relatively difficult way of riding, being led, on the other hand, is relatively easy —and this not on physical grounds alone. If A, as a member of the group, has exhausted himself in leading, then while being led he can, with a less expenditure of force, develop a speed which he could no longer have maintained as a leader; and may so far spare himself as to be able to take over the leadership again when the speed of the group is threatened. At this stage of the race it would be senseless for A to go off on a "lonely venture". Even if he succeeds by a sudden spurt in putting a distance between himself and the group, the group will make up the loss through its united efforts, even though every individual member is inferior to A. What a single rider cannot achieve alone he does achieve as a member of the group; his achievement depends on his ability to co-operate with the group, the speed of which, thanks to changes in the leaders, reaches a height impossible to the isolated individual. The head group has its special achievement and its special purpose; *it assures so high a speed for so long a time that contestants who have fallen out cannot catch up again.* The solution of the first task prepares that of the second; if the group's head-start is maintained, the number of contestants who must fight out the end is limited to the number of members of the group.

A new stage of the race necessitates a new tactic. The members of the group work out the solution of their first task as co-operating opponents, as colleagues, so to speak. On the relationship of forces between these colleagues depend the tactics the individual adopts in order to make the most of his own ability in the solution of the main task. Those who are best at spurting will not try to break up the existing group, but will save their forces for the final struggle. The steady speeders, however, will try to tire out the spurters; and by constantly changing the speed, which is continually maintained at a high level, they make it difficult for the spurters (whom they have formerly turned to their own uses as leaders) to 'get themselves led'. The spurter may reply with lightning dashes, which threaten to leave the long-distance speeder behind, while the spurter forms a new group with one or more of his faster colleagues, which group exploits the advantages of leading and being led in relation to the now isolated long-distance speeder. The picture can change in many ways, and any description can only be made in general terms, for in reality the head group can never adopt tactics without considering the proceedings of those left behind. By looking backward the leaders see what is going on among those who have fallen behind, and whether they are nearing the head group, either by sharp spurts or by increased tempo. If they are out of sight the leaders act on their knowledge of the capacity of the pursuers. The breaking-up of the head group itself into smaller and smaller co-operating bands takes place the sooner when the push from behind is sharp, and when there is a great difference between the capacities of the various riders. The followers also will often find in the principle of changing leadership the quickest and safest way of getting back to the head.

When I distinguished between 'being led' and 'getting oneself led' and spoke of a difference between the first and second stages of the race, I was not thinking of the spatial divisions of the course, but was rather contrasting two qualitatively different methods of riding. We must not overlook the difference between 'being led' and 'getting oneself led', because it points out the relation between the various riders, and also the task with whose solution they are occupied. It is true that the two tasks overlap at every moment, and no time-point can be determined at which the one is finished and the other taken up. What may easily be subject to conceptual division, may just as easily be without sharp demarcation in reality. Nevertheless, whole sections of a race are qualitatively determined by the task which the individual rider must solve. In order to make this comprehensible I will describe in more detail 'leading', 'being led', and 'getting oneself led', and will indicate the character of the structure.

Let us consider one group. In regard to its spatial distribution on the country road it is an arrangement of one rider behind the other in the direction of the goal. In this arrangement of one behind another we must distinguish between the one in front who leads, and those who follow after and are led. To lead means to be in front, to be at the head, but does not imply a qualitative superiority, and does not mean to be the first in ability. The spatial order gives no information about relative ability. The structure, to be sure, is fixed, but the positions inside the structure can change from moment to moment, and any rider can come forward from a rear position and take over the leadership. In the strict sense there is no ahead and behind ; to be nearer the goal has no special significance, since those who are being led and are farthest from the goal have no less chance than the leader who is nearest the goal. On the contrary, after they have been led for a time, the followers in the group will have more strength available than the leader, since he has the most difficulty of any of the colleagues with physical obstacles. In an opposing wind he acts as a protection to the others, he receives its full impact and must break it. If the road is in bad repair he has the burden of picking out the good and bad spots with an attentive eye. Always uncertain as to what goes on behind him, he must be doubly on his guard against surprises ; if one of the colleagues thinks the moment has come to break up the group, the leader is especially endangered, since, with his diminished strength, he finds it difficult to deal with a sudden spurt. These circumstances, as we have said, make *leading* a difficult way of riding ; but even more serious than the physical obstacles is the lack of certain advantages which being led offers. All this makes the position of the leader relatively unfavourable in comparison with that of the followers.

The rider who is *being led* has only one task, to 'hold' the back wheel of the man in front, that is, to keep the distance between the tire of his own front wheel and that of the back wheel of his leader as small as possible, while just avoiding contact. To do this he fixes his eyes on the tire of his leader's wheel where it is nearest to his own ; he thus creates a centre for his eyes outside of which nothing exists. The eyes, maintaining the distance, link him up to the man in front ; the isolated rider becomes a member in the structure. Oscillations in the manner of riding are regulated of themselves in such a way that the most favourable distance tends to be maintained without any expenditure of special thought or will.

In this connection there is a phenomenon which I have often experienced while being led, and which I will briefly describe.

With eyes rivetted on the tire of the leader, judging alterations in distance (without knowing in the strict sense that he is making such 'judgements') the rider moves on, kilometre after kilometre, concentrated exclusively on this one point. Suddenly the world changes; a moment before *he* was riding over the road, *he* was in motion; now he seems to stand still and it is the *road* which rolls on. Like a rapid band it rushes beneath his wheels into the direction from which he has come.[1] He stands at an unchanging distance from his leader, as if bound to him. When one experiences this 'change-over' for the first time, the puzzled eyes are apt to shift from their fixation point to the legs of the man in front in order to see if the movement has been checked. This shift of centration is at once revenged; if the rider takes visual cognizance of the pumping-rhythm of the other, his movements fall at once under his sway. Thrown out of his 'bondage', he runs into the machine ahead if his gear-ratio is greater, or loses his favourable distance and goes astray if his gear-ratio is less. There is only one protection against the compelling force of this dynamic—to look away, and with eyes fixed on the old spot, fall again into bondage. The rider can put many kilometres behind him while so fascinated, always dominated by the feeling of perfect ease with which everything runs on in this condition, as if he had nothing to do but to fix his eyes on the spot at the least distance, and as if his motor activity would follow without his doing anything about it.

The rider who, in contrast to being led, *gets himself led* (that is, takes up his following position against the will of the man in front) will scarcely achieve so close an association with his leader. The leader will not give him the opportunity to do so, he will change his tempo or his direction abruptly, he will expose the man behind to every physical obstacle, and so prevent development of the structure. Nevertheless the leader (who should better, perhaps, be called 'the first man') cannot help attracting those behind him; and the rider who gets himself led keeps up a fast tempo longer than he could if isolated. Leaders and followers reciprocally determine each others' performances; the leader draws the follower after him, the follower pushes the leader before him. The performance of a rider is dependent on the performance of the man with whom he co-operates. Thus one rider can win the race thanks to another, and so are explained many remarkable performances which had not been expected of a given rider.

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[1] An American colleague has told Professor Koffka that he has experienced the same phenomenon in cross-country running.

VI

Similar observations can be made in other sports. The middle-distance runner who wants to break a record lets himself be brought to a high speed over a part of his course by a pace-maker, who does not himself enter into the contest. Similarly a swimmer competes with his trainer in order to better his own performance, and this procedure is also known in horse-racing. A struggle can never be made by exerting one's own strength alone, the opponent is always there to stimulate increased accomplishment.

In swimming races it is not always possible for the best swimmers in the preliminary races to compete again in a final race ; so the one who has won his race in the shortest time is declared victor. It thus happens that the winner in a preliminary race against poor contestants may not secure one of the final places ; while one of these may be won by a swimmer who has only ' placed ' in a well-contested race, and who would always be defeated in a race man-to-man with the above-mentioned swimmer who failed to make a final place. The one who has failed to place has failed because of the inferior abilities of those who raced with him ; while the one who has placed has done so thanks to the winner of his preliminary race.

This is an undoubted drawback, which has, however, even been made into a system in a certain method of timing with electric clocks. In this system of measuring, the breast of each contestant breaks a cord at the start and at the finish, so as to start and to stop a clock. If both runners do not get off exactly together at the starting signal and the second one breaks his cord later than the first, then the race turns into a chase, in which the follower has all the advantages which we have described above. And this happens precisely because the timing does not begin with the starting signal[1] but with the breaking of the cord. Often the second one wins the race since he consumed a shorter time than the first, who has no way of judging the effort which he needs to make. Only a very few people succeed in running against time, especially over short and middle distances.

VII

The following incident is a good example of the importance of visual centration even when the performance has apparently nothing to do with visual factors. Several years ago at a competition of prominent 'heavy athletes' new records in weight-lifting were expected. The actual performances, however, did not even reach previous records, despite the stimulation of competition. One of the contestants found the solution of the puzzle. The place where the competition took place was a hall so brightly illuminated that there was no conspicuous fixation point on which the weight-lifters could rivet their eyes. Attempts, arbitrarily to use as a fixation-point some point not well defined phenomenally, were unsuccessful. The stability, accompanying a fixed spatial orientation, which is necessary for the lifting of heavy weights, could not be attained under the conditions existing in the brightly lighted hall; the expected records did not appear.

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[1] This disadvantage could be avoided—technically at least—by beginning the electric timing simultaneously for all the contestants at the starting signal, but stopping it individually at the end of the race. Thus we would again have a race man against man.

The beginner in bicycle riding learns to his sorrow the special effect which prominent points in the phenomenal world have. In his unsteadiness he is continually staring at the obstacles which he fears, and ends by running into them so much the more. A definite change-over in the organization of the phenomenal field, including a looking-away from obstacles, is necessary in order to traverse his territory successfully.

The goal-kicker in football has a similar task to the bicycle rider's. Like the latter, in order to be successful, he must learn to put a minus-sign in front of certain objectively prominent points, or let figures (in Rubin's sense) become background. I shall now consider this more fully, remarking in passing that other ball games provide similar examples.

When an expert, to whom the game is not merely a mass of men chasing a leather ball, follows a football game attentively he will always notice that the goal-keeper, standing before the comparatively large goal, is more often hit than can be accounted for by the mere adventitious kicking of the contestants. If the opponents' uncertainty of aim were alone responsible, there is no reason why every other point of the goal should not be hit as often as the goal-keeper. It is true that the goal-keeper gets into the path of the ball whenever he can, but entirely unexpected kicks also land near him more often than mere uncertainty of aim could explain. The answer, in my opinion, is to be sought deeper, and lies in causes already known to us. The goal-keeper furnishes a prominent point in space which attracts the eyes of the opposing kickers. If the motor activity takes place while the kicker's eye is fixed on the goal-keeper, then the ball will generally land near him. But when the kicker learns to reconstruct his field, to change the phenomenal 'centre of gravity' from the goal-keeper to another point in space, the new 'centre of gravity' will have the same attraction as the goal-keeper had before. I remember especially well a league game in western Germany. The enemy's goal as seen by the attacking side was apparently walled-up except for a small hole at the left. From my position behind the threatened goal I saw how the attacking left half-back grabbed the leather, fixed his eyes on the hole, and with all his might threw the ball through the one open spot. When I asked him afterwards what he had felt in that moment the lucky player replied, " I only saw a hole." The kicker must also try to prevent the goal-keeper from predicting, from the direction of his gaze, the path of the ball, and from being able to thus direct his attention instead of merely remaining tense.

The whole game may be considered from this point of view. To-day it is usual to train the aim of the players so that they can hit a pole from any distance and from any kicking position. It is clear that it is not a question of merely setting up connections between certain definite sensory elements and certain definite motor elements ; the visual situations are too diverse for this, and the possibilities of movement too manifold. What is practised is a unified sensory-motor performance which consisits in making that which is visually prominent the aim of an *act* based on motor activity. If the player wants to avoid aimlessly hitting the goal-keeper, he must add to his knowledge of the game an ability to makes points which are not physically prominent the ' centres of gravity ' of his attention ; he must learn to see where the opponent does *not* stand, so that the latter does not by his mere presence determine the direction of the ball. The players have a different task from the goal-keeper. As they move towards the enemy goal, they will see the playing ground as a field of changing lines whose principal direction leads towards the goal. Their immediate task is to discover in the line-system which is formed by the structure of their own team that line which most safely leads to success. This is best done by finding that way through the line-system made by their opponents which is not cut by any opposing player or does not pass near one. What happens phenomenally is really a change-over in the construction of the field in the sense of a shifting in the ' centre of gravity '. All the motor performances of the players (as shiftings about on the field) are connected with this visual shifting. Certainly this is not a case of logical thinking, since thoughts, in the ordinary sense, are alien to a player. He knows nothing of them ; in his tense state the visual situation produces the motor performance directly. In the ideal case we would have a smooth-working combination between the players of a team, where it would be possible (and this has recently been achieved in practice) that even a round-about path of 180° could be visualized as a way to the goal. It is noteworthy that only a mature technique has made it possible to go backwards with the ball in this manner towards one's own goal; the layman, who faces an entirely different phenomenal actuality than the expert, cannot comprehend such tactics.

When the ball comes near the goal-keeper he will not let it out of his sight; every movement of the ball when it is coming towards the goal pulls him around in its direction. The goal-keeper pushes into the dynamics of the line system, himself becoming that part of it on which the ball lands. Not until then is the hitherto unstable situation brought into stability for the goal-keeper; but he must be careful not to think too soon that his task is solved. Often the goal-keeper has the ball in his hands, visually the 'hole' is shut—then suddenly the ball slips away and across the goal. The muscular tension has been relaxed too soon; what was visually 'shut' had still to be 'shut' in the motor sense. Such fumbling of a 'safe ball' is one of the most painful experiences that can happen to a goal-keeper.

An especially instructive example is afforded in the catching of a ball kicked from a short distance, where the goal-keeper does not wait for the actual kicking of the ball in order to react to its 'recognized' direction of flight. His reaction has already been initiated by the manner and direction of the kicker's run and by his posture; 'sensory' and 'motor' form for him a unity in the sense that the motor performance is the continuation and conclusion of a process begun in the sensory (here visual) sphere. Since the course of his activity has its beginning in the 'visual', and since this beginning helps determine the end, an improvement in play must begin with an improvement of the phenomenal situation, that is, he must more and more be taught to see every situation as part of an end-situation and to effect changes directed towards this end-situation.

VIII

What has been said concerning the shifting of 'centres of gravity' and changes-over in the construction of the phenomenal field is supported by observation and personal experience. The expression "the goal-keeper pushes into the dynamics of the line-system" is more than a figure of speech; it is also a concrete description of a phenomenal fact which can be experienced by an outside observer as well as by the goal-keeper and the other players. In all this the 'vector' (as Köhler has called it in his descriptions of intelligence tests) plays a decisive rôle. This also plays a rôle in the favourite tactic of 'fake formations' the purpose of which, in essence, is to entice the enemy into a structure which is not completed, but in which they find themselves trapped. Before the surprised players have reoriented themselves, the ball is in another place.

A second observation made by Köhler on his chimpanzees finds its counterpart here. Like the chimpanzees, the players must continue "doing something in the direction of the goal", even when reaching it is out of the question, or when an interruption in the game makes it useless. The dynamic exerted by the goal and the dynamic of the stream of events is so strong that the referee's whistle is not enough to stop the movement. When a kick for the goal is about to be made the player is often apt to carry out his play even after the whistle sounds, that is, he shoots off the ball in the direction of the enemy's goal before learning the cause of the interruption of play.

A further short remark on the dependence of the performance of one team on that of its opponents. Many elevens show a model 'form' in training, but fail when it comes to carrying out this 'form' in a contest. The most perfect 'form' can be wrecked on the technique of the opposing team; it may not develop at all in the game. The reason for this is that a certain type of play may find itself confronted by a situation which cannot be solved by its usual methods; in consequence the team 'goes to pieces'. Its enforced dependence on the opponents may thus bring a team to ruin.

PSYCHOLOGY—SANS PSYCHE

BY PROFESSOR WILLIAM BENJAMIN SMITH

A hopeful sign of the times is the appearance in *Harper's Monthly Magazine* (May, June, July, 1926) of three articles on Behaviorism by the accomplished investigator and resolute thinker, Dr. John B. Watson. The essays have not merely a speculative interest; they are by no means an arid dissertation by some Professor Dry-as-Dust concerning some nebulous theme about which any one may think as he will, but about which no one can ever know anything as certain or even as fairly probable. No, the matter has a very practical and everyday importance. The Behaviorist's contention, if approved, must affect not only our civilization in general, but also our individual lives, vitally and at many points. Truth is mighty and will prevail, and if his contentions are correct we should proceed to adjust ourselves seriously and as fully as may be to the demands of the situation displayed in the outspoken theses of this brilliant experimenter. On the other hand, if these contentions be faulty, it is still more important that they be understood exactly and recognized under whatever garb they appear, that they be clearly and decisively exposed and refuted, and that the minds of the rising generation be guarded against their infection. If, as might seem antecedently more probable, these doctrines be a mixture of truth and error, then it is of no less moment that the chaff be winnowed from the grain, that this be consigned to the garner and that to the fire. For in any case the teaching is highly practical, it is charged with weighty consequences to our daily life, and it would be foolish to pass it by quietly as something of little concern, an airy theme for academic discussion.

I

What, then, is the doctrine in question? How state it in a few plain untechnical terms of easy comprehension? The reader must be grateful to the author of those modest twenty pages for the admirable spirit of honesty and directness that animates them in general, for the many clear and unmistakable deliverances at critical points, for the unflinching courage that shines forth in almost every section. What he will most miss seems to be a summary and compact statement of general results especially in relation to philosophic and other psychologic systems, to other interpretations of racial life and individual experience. But the prevailing tabloid form of literature has certain defects of its qualities, though the attentive reader has much more reason for thanks than for complaint. It would be very agreeable to quote largely from the original, but we must be content with brief citations followed by parenthetic reference to the pages quoted. Further, our own comments must be blunt and dogmatic, but they are fully warranted by the original text.

To begin, then, Behaviorism, as expounded authoritatively and ably by Dr. Watson, is bare Materialism, if not indeed Mechanism —an heroic essay to state and interpret all the alleged 'mental' facts of life in terms of mass and *motion*. Not that any such terms are mentioned in the articles, they seem rather to be cautiously avoided. But the 'isms are none the less present because nameless. For Behaviorism is simply the doctrine of behaviour, i.e. of what we *do*, i.e. of what *Man does*; other animals as well as plants, minerals, electrons, and so on, lie outside the circle of consideration (except in illustration), though of course they have their own behaviour, to which the arguments would apply a fortiori. Now what we *do* is to move in whole or in part--no more, no less. So much at least is all our author recognizes. Motion constitutes the whole of behaviour. What motion may be is never asked or answered, though abundant illustrations are given. It is tacitly assumed that we all know. But the physicist is more explicit. He tells us motion is a continuous change of place during time, and the whole doctrine of motions is what he calls Mechanics. Said Kirchhoff: " Mechanics is the science of motion. Its problem is to describe the motions that take place in nature, to *describe* them exactly and in the simplest way." What better could be said?

Now the problem of our author also concerns motions solely, and he insists that Behaviorism (quite unlike the fictive subjective psychology) is a science (p. 724). As such it must be a section of Mechanics, the Science of Motion—by no means the whole science, but the most important part—its subject being human motions, and its goal being double: first, to gain such knowledge of these motions, of the orderly ways of their occurrence, as may enable us to predict them with a high degree of probability and accuracy—a goal already in some measure attained; and secondly—a much higher ambition—to gain *control* of these motions so as to be able to shape the future of a man, to make him from a babe after our own heart into whatsoever kind of man we will, and even more, to unmake him (where improperly made) and then make him all over again according to any pattern prescribed (p. 728). Our author is in good earnest, and he cherishes logical hopes that even this immensely remote goal of his science may be, if not quite fully reached, at least approached within hailing distance.

Thus the aim of the Science of Conduct is not merely to know or describe how we act, but also to modify the action at will; it is not merely pure science—but much more—like chemistry or biology, it is applied science as well.

Pure Mechanics describes a motion completely by answering (at least potentially) every rational question that can be put concerning it. There is nothing but description, no question is raised about cause or effect. Mechanics tells precisely *how* the motions take place, but never dreams about any *why*. Yet it fully recognizes that relative motions and relative positions (both the only kinds) are definitely interrelated: as a mere inexplicable fact, the tide does not move, when the sun, moon, and earth are nearly in line, as it does when they determine a huge right triangle. We may, if we will, call the sun-moon system in either case the stimulus and the tide-motion the response. There is no objection to such language, if clearly understood. We mean only that the tide moves *as if* sun, moon, and earth were joined by elastic bands (every point with every other point) and were tugging at each other in a certain way known as Newton's Law of Inverse Squares. We do not mean that any such pulling does actually take place, but only that all happens *as if* it did (Vaihinger).

II

Now it is upon this mutuality, this connection of motion with relative position, that the Behaviorist (Watson, Kantor, Weiss, or whoever he may be) lays the most emphatic and persistent stress. All human conduct (as *bodily* only and wholly) is interpreted simply and solely as action and reaction, as Stimulus and Response. Indeed Behaviorism might be defined in one word as 'Kinepistrophology', the doctrine of Stimulus and Response. Thus a dog or child dodges, perhaps flees, at sight of an uplifted stick, a woman at glimpse of a mouse, a man on seeing a coiled cobra, a whizzing ball, a levelled gun. The untutored say the dog (or the person) dodges and scampers away because afraid, but that is a *subjective* answer that cannot be *verified*. The fear cannot be seen, measured, photographed, and so made a matter of scientific study; it must, then, be discarded as a mediaeval cloak for ignorance. All the Behaviorist will admit is the *act*, the response to the stick- mouse- or gun-stimulus, the new spatial re-arrangement and adjustment to new conditions—which may be photographed and measured — all of which is a complex of motion. Precisely as the tide adjusts itself by rising to higher levels when earth, sun, and moon fall nearly into line, so the dog (if properly *conditioned*) adjusts himself by a quick dart to one side as the cane is uplifted. Astronomy may call it attraction in the case of the planet and calculate the motion exactly; Behaviorism might rather say repulsion in the case of the animal, but has not yet quite the necessary mastery of material to reckon the response with precision—but Behaviorism is young yet, and all it asks is time. With multiplied and refined gratings, cameras, microscopes, and with unwearied 'trained observers', it may attain unimaginable skill in prediction and be able to forecast the jump of the dog almost as precisely as the engineer may foretell the flight of a shell from the mouth of 'Big Bertha'.

All such reactions of dodging, shrinking, and the like are 'fear-responses', but the first syllable is used merely for convenience, a concession to the reader's hardness of heart. A 'fear-response' is knowable, describable, measurable, and so is admissable to the society of Behaviorists and to the councils of science. Similarly a 'love-response'—however absurd it may sometimes appear, as of a handsome "lad of twenty" to a "hunchbacked and disfigured woman of forty" (p. 728). These two principle responses remind us of the Love-Hate pair that figures so conspicuously in the system of Empedocles, and almost make one exclaim: "Transformations of transformations! Is there anything new under the sun?" But we have no right to hypostatize either fear or love, and suppose there is any reality corresponding to either. They are merely distinguishing marks of complex motions; the letters X and Y would do quite as well, just as we say A-, B-, C-vitamins and are content. If there were any such realities (existent or subsistent) as 'fear' and 'love' they would surely be 'mental', 'emotional', and not merely 'motional'; and all such wisps of mediaeval darkness are swept away by the dawn of Behaviorism. The term 'emotion(al)' is indeed retained, but only in deference to the weakness of the dictionary. There is an "enormous field of habit never verbalized either in the child or the adult. . . our glands form habits—become conditioned. Even at a very early age our unstriped smooth muscle tissues —our viscera—form habits, become conditioned. And let us include under the term viscera such structures as lungs, heart, stomach, circulatory system, elimination system, and glands. Let us call the habits set up in these structures emotional habits for lack of a better term. *Such habits are never verbalized.*" (p. 249). "Again, even as adults our viscera are constantly putting on new habits—our avoidances, repugnancies, our attachments to people, places, things—these are not verbalized. There are almost no words in the dictionary relating to our visceral happenings. *Hence we cannot talk about these things.*" (p. 249). So then, thanks to Behaviorism, the 'attachment' that would lead a mother to die for her babe is raised almost, but not quite, to the dignity of an ovarian tumour; and when the society-leader's husband forsakes her for a chorus-girl, why should she complain? He means no harm; it is only a viscus that would put off an old out-of-date habit and put on a fresh one.

III

Such is the story, vivid, eloquent, and easy to understand. Of course we are reminded of the James-Lange wisdom, that we do not weep because we grieve but grieve because we weep, which is here relieved of its paradox by simply omitting the grief. Emotion proper is not acknowledged at all, but only 'emotional habits' "set up in these structures" (viscera), and called 'emotional' "for lack of a better term". We might in fact just as well drop the 'e' and then paradoxically explain it all with more ease than before. For these 'emotional habits' can be nothing but motional habits. These viscera can do nothing but move. In Genesis XLIII, 30 we read that Joseph's "viscera (*rachamim*) yearned toward his brother". The Collossians are exhorted (III, 12) almost in the words of the Behaviorist, to "put on viscera (*splagchna*) of mercy". The notion, then, is classic. Horace tells us how his liver boiled with indignation; and we read of Agamemnon Atreides, that "his midriff, darkened with choler, swelled all round". Homer regards this as an 'emotional habit' of Atreides, but it was in truth only a motional habit of his midriff, a case of diaphragmatism, and in the light of Behaviorism it is not clear what Atreides had to do with it—in fact there was no Atreides at all, it was only the full-grown viscus that had put on this kingly habit. It is not we but only "our viscera" that, "as adults", "are constantly putting on new habits"—the whole array of our *feelings*—and these habits, it cannot be too often repeated, can be nothing but sets of motions[1].

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[1] Some one may say: "But there's something that moves, the mass of the viscus." Very true; but this is implied and not necessary to state. Besides, mass is certainly interpretable as space-curvature, a complex of masses (atoms, sub-atoms), as a tangle of crinkles in space (as in a line or surface), and the whole motion of the midriff as purely spatial-temporal, a shiver focussed in a certain region of pure space.

This understanding of Behaviorism as the doctrine of organic movements is completely confirmed by the author's explanation of thinking—which, he insists, is solely a bodily exercise, a gymnastic performance. The Germans builded better than they knew in naming their junior colleges 'gymnasia'. Hitherto thinking has been treated as rather 'mental', and "the distinction between purely 'mental' activity and physical activity seems to be very real to the layman"—in his ignorance. "*But the Behaviorist admits no such distinction.*" (p. 40). The words we have italicized seem to be decisive. If there be no distinction between 'mental' and physical', the latter, since it is undisputed, must include the former as one of its parts. There follows in the text a long discourse on 'verbalization', on how the child *substitutes* a word for an object (sound for sight, laryngeal for optical activity), how it talks incessantly and intolerably, is reduced to mumbling, and finally to silence. "Complete socialization next occurs. *The child goes on speaking, but he really talks to himself. There is inward verbalization*"—which alone is thinking.

"Thought, then, is a form of general bodily activity, just as simple (or just as complex) as tennis-playing. The *only difference* [italics ours] is we use muscles of our throat, larynx, and chest, instead of the muscles of our arms, legs, and trunk." "Thinking is just as commonplace as any other form of motor activity." (p. 42). It seems needless, however interesting, to quote further, since nothing could be more explicit. We see, then, how superior the spectators are to the players at a baseball game. The players use only or mainly "arms, legs, and trunk", but the spectators are the great thinkers, they use "the muscles of . . . throat, larynx, and chest". Every shout is a glorious thought winging its way over the field. Alas! We had momentarily forgotten that "thinking is just as commonplace as"—sneezing, or chewing gum. "No joke", you say, "the yells really express the thoughts of the grand-stand." But the question is not about expressing thought, but about thought itself.

However, we would do the author no injustice. He does not mean the muscular activity of some "Tydeides good at the war-whoop", but the far more modest insensible movements that do seem (at least, sometimes) to accompany thinking. With much, if not all, that he says so well about 'socialization' as supressing talking and reducing it to mere thought (in the case of Congress, a five-o'clock tea, *et id genus omne*) we are glad to agree; but the one momentous matter now is that thinking is defined unequivocally as physical, as motion and nothing but motion: "Thought, then, is a form of general bodily activity." This term " general " is very generous, for it gives the *brain* (not otherwise mentioned, perhaps under suspicion as a silent partner in the firm of Mind, Soul, Spirit, and Co.) some chance along with the rest. Words could hardly be plainer. Herewith, then, mind, soul, spirit, with all their affiliations, are stricken from the vocabulary of Psychology. They serve no purpose but to call annoyingly for inverted commas, as in ' mental '. If admitted at all, it is only under protest, " for lack of a better term ". Thus: " It might be better to give up the term thinking and use the term implicit behaviour in its place "—certainly a sage suggestion. As long as the false term is current, men may actually think they think! Possibly a little awkward at first to say " What (or How) are ye implicitly behaving concerning the Christ? " but Goodspeed, Moffatt, and the rest would welcome and very soon naturalize such verbiage as quite in clang with the Twentieth Century.

IV

Now, joking aside, we must ask in all seriousness, Is the Behavioristic thesis correct? Is it true that Psychology is simply Myology? That all thinking is nothing more nor less than twitching of neuroglandulo-musculature? That the war-whoop of an Indian is the same as the meditation of Socrates or the calculations of LaGrange, only more so, all being only the undulatory contraction and relaxation of elastic fibres, a trivial re-ordering in a whirlwind dance of atoms? Is it a fact that all our feelings—hopes, fears, loves, hates, joys, pains, desires, and memories—the totality of our emotional life, is merely a crawling and creeping of unstriped visceral muscles, like the dumb show at the most miserable cinema, as senseless and unfeeling as the film revolving in the dark? Is the Universe really only an infinite vortex of electrons reaching invisible hands to protons—only this and nothing more? Is all History but a continuous wriggle of irregular space, in the main flat and uniform, but here and there twisted and contorted into stars and planets, and worst of all, into plants and animals—*infandum*?

Be it well understood, we have not called in question now, nor indeed for many years, the actuality of all this motion: it is an old and approved tradition. The point is, Must we accept this as the *whole* story? Is it *all* the Universe? And beside it, is there no other? Such and such only must be the contention of the Behaviorist. Such is his differentia, his distinctive mark. He sweeps the deck clear of all such antiquated refuse as mind, soul, spirit, consciousness—all are swished overboard into the sea of oblivion. The spots they formerly disfigured are scrubbed and polished and carefully placarded: "This was once called *thought*, it is now *implicit behaviour*; This was formerly *feeling* or *emotion*, it is now the *functioning of glands and unstriped muscle*; This was sometime mentioned as a *self*, *personality*, or *person*, it is now an *organized localized movement continuum*". It is a new dialect we are learning. In reading such a really weighty work as Kantor's we do not seem to be saying "This is the house that Jack built", but rather, "Behold the mansion reared by daedal Hans!'

Yet the vital question remains, Is the Behaviorist justified in his positions, not so much in what he affirms, as in what he denies? If so, we must accept all honestly and at any cost. Loyalty to Truth is absolute and admits of no degrees. Is the Behaviorist's reasoning sound? The unhesitating answer must be, No! We need have no quarrel with him concerning his facts. At least for argument's sake we may accept them all at face value—that is, as a system of *Signs*, meaningless and worthless without their *Significates*, which the Behaviorist ignores. Let him inflate the currency with as many more as he will of the like denomination,—he need not fear for the fate of ruble, mark, or franc. For all such facts are obviously, on their own showing, facts of mass and motion, but all of a certain order orever incomparable with the 'mental' facts in question. These latter stand on their own feet and their own ground, separated from the physical facts of mass and motion by an unbridgeable and impassable chasm. Let the physicals swarm as they may. They can never tramp on any toe of the psychics. The most that laboratories can ever do (not to detract in the least from their interest or importance) is to exhibit the fact of physical life in its moving environment as a more or less perfect continuum of motion. In this praiseworthy task let us ungrudgingly suppose its success to be perfect and complete.

Well and good! Then we shall understand the life-history of a physical organism as we understand the axial rotation of the earth or its revolution round the sun. But nothing more. Of the real experience of that being, of its psychic life, its thoughts, fears, hopes, loves, hates, and the like, we shall therefrom learn no more (unless by analogical inference) than we can learn of the taste and colour of an apple by studying a nautical almanack. Emphatically, physical stimuli and responses, no matter what the conditioning, are still only facts of mass and motion, and as such they have their proper place and due significance. Gladly granted; but they can never be equated to the least element of psychic experience, no matter how deftly manipulated, for the two classes stand asunder like the poles. Given all the atomc and sub-atomic motion in the universe, you cannot constitute from it the slightest pain, the mildest joy, the feeblest hope, the faintest fear. Photograph with absolute exactness the musculature of throat, larynx, thorax, the whole body, in a mathematician at his desk, and reproduce it exactly at any pace you will on the screen: what will that tell you directly about his equations, his thought? Absolutely nothing. The symbolism and therefore the whole muscular co-ordination may be changed throughout, without in the least affecting the logical process. To *identify* the muscular play with the 'mental' is to suppose we can make logical ties in a shoe string or cut logical ties in a syllogism with a safety razor.

Just here, however, a caution. If in *many* cases a special type of muscle-motion were observed, and if all the subjects testified (truthfully?) that just then they were thinking in one and the same way, then indeed we might infer with high probability that certain muscle-motions regularly accompanied and hence indicated or symbolized certain types of thought, just as frowning and frothing may *indicate* anger; and the study of such symbolism might lead us—none can say how far—on the path of prediction. But not one inch toward the Behavioristic position; for the muscle-motion is in no case the thought or the least like it, but only a *symbol* thereof, as the froth and frown are only *signs* of anger, not anger itself.

But are not the objective facts as the Behaviorist states them? Do we not sometimes mumble and talk silently to ourselves? May not our whole muscular system squirm a little when we think (i.e. implicitly behave) very hard? Grant it fully; it is not worth arguing. Once again, however, it is a huge mistake to identify any such physical partner of thought with thought itself. A dog howls, a weakling weeps, in pain; but howl and tear are not pain, nor is any muscular, nervous, or glandular action that may be associated therewith. No one mistakes the contortions of a 'jazz'-conductor for the music of his band. His pantomime may indeed be meant to represent the music, so as to direct the motions concerned, but it bears not the faintest resemblance to the music itself, which is heard best with the eyes shut. A man may fret and fume over an emotional situation, and his viscera may swell like those of Horace or Agamemnon, and in some sense this tumescence may *represent* his disturbance of feeling; but in *being* the two have no more likeness, not to say identity, than has the letter 'I' to the diphthongal sound or to the indicated speaker. So a man may wrestle for months with a mathematical or other problem, and his musculature may be twisted into countless contortions, which may perhaps figure in some unknown way the writhing of his persistent thoughts, but they have no sort of sameness or even likeness with such thoughts—no more than the numbers 3,4,12, which represent a point on the sphere-surface $x^2+y^2+z^2=169$, resemble that point which they represent.

V

Here we touch the nerve of the matter. The Behaviorist has found a series of outer events that he can vividly envisage, accurately measure, faithfully describe. All these physicals he accepts at their face-value as the sure and final facts of the universe. But there is, or seems to be, another series, most intimately involved with the first, but not nearly so easy to envisage, measure, and describe—the psychical facts of life. These belong to each individual self or subject, they are not matters of common observation. There is no way to test any report that anyone may make. B may say, " My tooth hurts me ", but how shall we prove or disprove it? The dentist may find a cavity and may feel sure that B has felt the pain, but that is only an inference; all he can *know* is the cavity, not the pain. Even were his powers of discernment magnified a million times, it would not help him in the least to verify (or falsify) the experience of B, which is B's and B's alone. Hence this *subjective* series is not subject to scientific study, as the so-called *objective* is. So much—and it is a great deal—must be conceded to the Behaviorist. B's report upon what he feels, thinks, wills —all this is precisely like his report upon his own dream; we may accept it in whole or in part or not at all, but we can never experience it ourselves. We can neither verify nor falsify it by any experiment.[1]

Not unnaturally the scientifically-minded Behaviorist, solely intent upon objective verification, upon establishing a common world of provable knowledge, becomes impatient with the subjective series, each attested by one witness only whose trustworthiness he can never prove, and so he resorts to the expedient of entirely disregarding and dismissing the subjectives, and throws them overboard. He treats them precisely as are-nots. If there be any salvage at all, it is taken up into the objective series, and is bid be quiet and submissive on pain of again being flung overboard, unceremoniously and without regret.

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[1] We hazard the conjecture that this incommunicability of immediate experience is the deep underlying reason for the universal objectifying activity of spirits. They seek communion, the knowledge of each other. As this is once for all impossible by direct communication, resort is had to the construct, the time-space image, so nearly alike for all that it may pass for a single object, the basis of common study and science.

The provocation does indeed seem to be extreme, and one may feel some natural sympathy with such high-handed measures; undoubtedly the yearning for a common objective world of verifiable experience makes strong appeal to the genuine scientific temper. Nevertheless the procedure is not justifiable. The subjective series cannot be effectively depreciated, much less negated. It is in fact *the* series, the only one that has ultimate, irreducible, and, indeed, exclusive significance for any one, even for the Behaviorist himself. Strive as he may, he cannot evade its recognition. Read carefully the work of any Behaviorist, even the discreetest; you will find its pages strewn with expressions that tacitly assume the full validity of the very series he has so earnestly abjured. He will write "we understand", "we appreciate", "I know", "I conclude", "they decide", "I wish", and so on without end—all subjectivisms, and all implying the series so studiously ignored. In fact, every Behaviorist is an Ego, a Self, an Individual; and even though he be a universal genius he cannot lay aside his selfhood, his individuality.

The two series, then, must be faced honestly and without reserve as co-existent facts. Countless endeavours have been made at ordination, co-ordination, and subordination of the one to the other. Hence the various forms of philosophy. Behaviorism has the merit of thoroughness. It rejects the *inner* series entirely, in the interest not of philosophy, on which it pours threats and contempt (p. 726), but of 'psychology' (*sans psyche*), of scientific method, and of practical service to mankind. It will have nothing to do with subjectives that cannot be subjected to scientific study and control. "The old subjective psychology never had any right to be called a science. To be a science, psychology must use the same material that all other sciences use. . . . Its methods must be the methods of science in general." (p. 724). So nothing seemed left for the Behaviorist but to ignore the subjective series entirely!

Possibly he might be forgiven for ignoring the subjective series; he might be allowed to build up without rebuke a doctrine called Behaviorism, or Theory of Stimulus and Response. But why call it Psychology, when it expressly repudiates Psyche, the Mind? A new Psychology might very well present a new theory of Psyche, a new doctrine of Mind; but a teaching that expressly rejects Psyche and admits only the body is not new Psychology, but Apsychology or Somatism, and reminds us too forcibly of "Snakes in Iceland".

VI

This is not all, however, We have seen that the Subjective Series cannot be finally eluded, and we now ask, Is the Objective Series quite so truly one as it seems to be? Is there just one Objective World standing out there unshaken as Gibraltar, alike for all of us and quite independent of all of us, a genuine Object, one and the same, which calmly looks on while we " flutter through our little day ", sublimely indifferent as to whether we live or die, whether we are or are not? Such is the basic assumption, not only of Behaviorism, but of every form of Realism or Objectivism; and never before in all history was there such persistent and determined striving to vindicate this exalted Sovereignty of the Object and to reduce the Subject to a rank far below the humblest helot.

Let the answer be explicit and emphatic: *There is no such Object known to Man.* It is not true that the outer world around us is either permanent or independent (though it none the less offers genuine matter for scientific study). On the contrary, that world is the most perfect example of impermanence and dependence that is conceivable. There are, in fact, as many object-worlds as there are subjects; moreover, the object-world of any one subject undulates from instant to instant, it is made, unmade, and remade as fast as we can perceive; the perception is indeed the creation at each instant of the percept. Schopenhauer begins, " The world is my Idea " (*preposit, Vorstellung*). He erred in the first word, which should be ' My ', not ' The '. Better still, " My worlds are my preposits." For the outer world of each subject is really a compact series of momentary worlds. To realize this vividly, just stand before the mirror. Suppose it very large and very smooth. You see a world behind it, which admittedly has no existence there save as you see it, which ceases to be when you close your eyes, and becomes again when they are opened.

The like may be said of your vision of a world in front of the mirror, but this you may not so readily grant; you may say this world is there all the time, only you don't *see* it with eyes shut. This, however, is not correct. The world of your *sight* is not there when you don't see it; it is made in the act of seeing—that is what seeing is. A world of *touch* is indeed there when you fumble in the dark, a world made by your touching, but not the same as your world of sight, made by seeing. Ages on ages of ancestral experience (continuous with your own) have finally enabled you to co-ordinate these two worlds almost perfectly—but not quite, as the Aristotle illusion of the two balls between crossed fingers shows. Accordingly you say there is one independent object-world out there, which you do not make but merely *discover* by your senses of sight and touch. This is perfectly natural, in accord with the fundamental trend to objectify all experience (which we may notice every hour of the day), and is also extremely plausible, but is none the less entirely false. Completely organized experience might, indeed, persist in its prejudice and remain forever deaf to all counter pleading; it might be impossible to convince a man of such an experience.

Fortunately, however, not all experience is so completely organized, socialized, and co-ordinated. The " baffling phenomena " (Whitehead) of Error, are the most instructive of all, yet they hardly receive the slightest notice from Behaviorists. Such are Reflection, Refraction, the Rainbow, After-Images, Double Vision, Hallucinations, Dreams! In their uncanny presence all realistic psychology collapses. Witness the heroic endeavors of the six collaborators in *The New Realism* and elsewhere, witness their admissions and the hardly less significant admissions of thinkers such as Whitehead, Russell, Keyser, Broad, and others. These champions of Realism have climbed by various paths to the utmost peaks of intelligence. The higher they have gone, the wider and clearer their view, the more distinctly they have seen and recognized that Realistic Psychology is impossible. In such facts as the above, no more deniable than the sunrise, " perception is caught *flagrante delicto*, in the very act of making percepts in perceiving ". Hold up a pencil before your eyes and look straight at the moon—you see two pencils; then look straight at the pencil—you see two moons. The Realist has no better explanation than that you have two eyes! which must be frankly conceded. McDougall in a footnote honestly admits the mystery. Yet it is no mystery at all, but the simplest of all facts. The whole world as seen is double (though the images in the main blur together), because it is made so through the two agents, the eyes. To every point P there corresponds P^1; only in the fluctuating horopter do P and P^1 fall together. It does not avail to say that the eyes are the agents, and they are material. True, but as material the eyes are themselves *constructs*, objectifications of psychic activities. So also in reflection, as already noted. Obviously the mirror-world is the creation of the observer acting through the (objectified) optical forms of his mind-activity.

Consider also the rainbow; as plainly as can be, it is made by Psyche in the activity called *seeing* and preposited in the cloud of wonder. *Your* rainbow exists for you only; close your eyes (suspend your specific psychic activity), and it ceases absolutely to be. Your companion may still behold his own rainbow extremely like yours, almost as like as the two moons or pencils, but still wholly another at every point; for it is made by him and not by you. Look at the electric bulb steadily, then turn off the current. You carry the after-image round with you for a few minutes in the dark. Some would evade the fact by calling it an 'after-discharge', as if the change of name could change the fact in the least, the fact that the mind-activity continues under the altered conditions and still *preposits* an image, a construct: that is what you *see*—that gradually subsiding activity, as objectified, is the fading sight. Consider also the dream, the Waterloo of all Realism! As manifestly as can be imagined it is a construct, a *prepositum*, the objectified interpretation of some psychic experience (generally at or near the moment of waking), built up in the same fashion as all constructs in waking vision, but not in *association* either fore and aft or on either side—neither in the organized chain of the dreamer's own experience before and after dreaming, nor in the vast web of experience that interlaces him firmly with his fellows on every side.

Since such dreams and all hallucinations can never be unified and organized with the body of experience, they are rejected as unreal, though just as actual as any other constructs. In fact (to quote again from myself), "the Unreal is the Dream of some, the Real is the Dream of all". The worlds constructed by different men are very nearly alike, since the men themselves are so very nearly alike. Their differences are disregarded, and we accept a vague general similarity as an abiding external reality independent of us all, as an object not that we have *made* but that we have *discovered*! This is entirely false, but it serves as one of the great *as-ifs* that make up so much of our life. We act *as if* the universe were a huge thing wholly outside us and independent of us, which we must study and some way come to understand by laboratory and other methods. All this is the mythology of science. As the ancients objectified some history, tale, notion, or nature-fact into a god, a Zeus, a Hera, an Isis, or Adonis, and then worshipped this figment of their own fancy as a power above and beyond them, eternal it may be in the heavens, so we in far more thorough-going fashion have objectified the organized, rationalized, socialized body of our experience into the World of Nature around us, and bow down prostrate in worship before the Universe of Things. Such is Realism, the doctrine of Thinghood, of Things.

VII

But you say, "The Laws of Nature, the Laws of Things, the Universal Relations, the Properties of Space, Time, and Number, the Permanences and Uniformities of the World, the stedfast Stars, the invariable (?) Atoms, the Order and Regularity of the Whole! It is these we study and admire. These are the sublime Realities of the Cosmos, in comparison with which *we* are the emptiest bubbles, mere phosphorescent gleams on the face of the deep, mere 'short-lived reptiles on the dust of earth'." Such is the attitude of the Realist, and a more unfortunate and despairing one it seems hard to imagine. We answer that we do not belittle Nature, her laws, her order, her atoms, or her stars. But we do ask what they are, and the reply is unequivocal. Unless all experience be a lie, all such are constructs, objectifications, *preposita* of the one eternally active Psyche (Soul, Spirit, Mind), always making, unmaking, and remaking its endless sequence of compact series of worlds on worlds, through all its countless phases or facets that we call Individuals. One and all, such physical uniformities are the signs, symbols, and objectifications of uniformities in the multitudinous activities of mind itself, as the 'variety of nature' is likewise an image of the variety inherent in the activity of the multifacial universal soul. These regularities run through the whole system of the psychical and are shadowed forth in the corresponding system of the physical which we call the world, the latter being the incessant depiction of the former. There is, then, no reason whatever to stumble. The case is plain.

Perhaps the most perfect of all illustrations is that furnished by Analytic Geometry. Descartes taught us that an equation such as $x^2+y^2=25$ may be depicted by a circle of radius 5 about a centre, O, called the origin; similarly an equation such as $x^2+y^2+z^2=169$, by a spherical surface of radius 13 about the same centre. These are extremely simple examples. In general, equations between variables called co-ordinates may be depicted by lines, surfaces, or spaces, and these latter in turn by equations, to any degree of complexity. In the circle, to any pair of values of x and y, as 3, 4 (in the sphere to any triplet, as 3, 4, 12), will correspond a point. There is no resemblance between a point and a pair (or triplet) of values; but the whole system of (real) equation-values is in each case shadowed forth, symbolized, represented by the system of points constituting the geometric figure —the properties of the number-systems are imaged in the properties of the so-called loci (or figures); and conversely.

What more could be asked to make the meaning clear? Let the timeless, spaceless equation stand for the psychic world, its variables in any number for the individual spirits, its totality as a single equation standing for the unity of all. Then the physical world will be figured by the locus, the geometric form that corresponds to the equation. Surely Behaviorism, which regards the person as a localized, organized continuum of motions, cannot object to this representation. The difference is that this view regards the physical not as a finality, not as the be-all and end-all, but only as a sign, a symbol, a picture of the deeper reality, the psychical; whereas Behaviorism seems to reject this latter as a mere fancy of philosophy. But we have seen that the facts of every day experience unequivocally attest every moment the actuality of psychic activity and imperatively demand its perpetual presence if there is to be any understanding of life.

Now as the study of the equation is really the study of the geometric locus, and conversely, as the mathematician passes with ease from either to the other at his own convenience; so the man of science in studying the physical world is really studying the psychical universe as well, the laws and uniformities that he discovers therein are only the counterparts of profound originals ingrained in the being of the psychical world. Nor need it surprise us that the study of the sign is often far more profitable than the study of the signified. It is the deepest tendency of our mental being to symbolize, to make gestures, to put forth tokens; we are doing so constantly and everywhere, in writing, in talking, in action, in meditation, in waking, in dreaming, in science, in art, in religion, in commerce, in banking, and in law. It would insult the reader's intelligence to multiply examples. Let, then, the Behaviorist study as he will the emblems of 'mental' activity that he finds in the habits of individuals and of races—we bid him God-speed—but let him not mistake these emblems for the mind's working itself, let him not suppose that the frown of anger is the anger in truth, that the twitchings of a mathematician's muscles are his logical processes in developing the theory of numbers.

Some one may object that this doctrine of symbolization is hard to understand, that it is not simple and easy to grasp, whereas "simplicity is the seal of truth". Yes, the doctrine is complex and not readily mastered at first, though not more so than Analytic Geometry, or many another teaching that we accept as a matter of course. But is this acknowledged difficulty in fact an objection? Is the Latin saw about simplicity really itself a truth? Very far from it, indeed. What is there that is simple and at the same time true? How plain that two and two make four! but who really understands it? Comparatively simple statements are accepted in science, but as provisional only, as 'working hypotheses '. The actual state of affairs always turns out to be immensely complex. Newton's Law may sound simple enough at first, but even in its barest form it is straightway found to be endlessly complicated in every application. The like may be said of any other natural law or process. Truth is in fact never simple: it lies in a deep well. The difficulty of the symbolic conception weighs rather for than against it.

VIII

In conclusion it seems impossible to omit all reference to the notion of *value*. Even granted that the moral trend or tendency of a teaching is no test of its truth, we are still intensely interested to know what the trend or tendency is. In the present case the answer need not be delayed. There appears to be no hiding place in Behaviorism for value of any kind whatever. If the totality of the universe consists of time, space, and motion, if thinking and feeling (misnames " for lack of better terms ") are only twisting of striped and unstriped muscle, then there is neither good nor evil in the world. A motion is nothing but a continuous change of place in time, it is neither good nor bad, neither right nor wrong, neither true nor false, neither beautiful nor ugly; it is just a crinkling of space, neither more nor less. And what is said of any one motion may just as well be said about a decillion of decillions. They are all absolutely indifferent. They have quantity, but no quality whatever. The Behaviorist may indeed talk about colours, red, green, and blue, but his words have no meaning. ' Ether ' vibrations may differ in frequency and amplitude; these are intelligible marks of motion, but there is not the faintest suggestion of colour about them. Elementary motions may vary in size, in velocity, in acceleration (of any order), and they may be compounded in any degree of complication; but they still remain motion and nothing else or more. There is no room in any such mere motion-world for anything that we *value*, for any beauty or goodness or joy or *worth* of any kind. The huge star is worth exactly as much as the tiniest atom—and that is just nothing at all. Who can see the slightest reason for the continuance of such a world? Let it vanish at once! No being therein would suffer in the least or would take the slightest notice; for suffering and noticing are psychic, they refer (if to anything) to ' mental ' activity, and that is all gone—its place is occupied by muscular crimpings and contractions. It seems well to consider just what kind of a world is left in the track of the Behavioristic broom.

But in spite of himself the youth will continue to feel and to think, though he may have long since adopted the Behavioristic creed. His impulses will remain much as they were, though he may refuse to name them, to verbalize, but the important point is this: that he will no longer find any reason whatever for controlling, restraining, or disciplining them in the least. Since feeling, thinking, willing, virtue, vice, right and wrong, good and bad, are all only makeshifts, mere transients, used only " for lack of better terms ", why make any resistence at all? Why not take the shortest and easiest cut? Why not do as you please, let your motions have the freest play, the widest scope, and live your life as fast and fully as possible? This leads to the creed of the bandit, the burglar, the bootlegger, the Chicago gunman. Absurd, of course, and contradictory, but how will you oppose it on Behavioristic grounds? What stay, what bulwark can you interpose against the wild current of unregulated desires? There seems nothing to do but to let such a generation kill itself off.

Not that Behaviorists themselves are victims of such lawless impulses: it may be that because they are so little tempted themselves they pay no heed to the temptations of others. They are philanthropists and benefactors, ardently devoted to research and experimentation, eager to widen at every point the realm of knowledge and to shed light upon the dark spots in human nature. They are nobly immune to the most dangerous germs that inhere in their own doctrine. And yet one is not quite sure that even such leaders can wholly escape some mild contagion. Even the master delights in pouring contempt on things that some men prize as the brightest gains of humanity. Again and again we are warned against " the poet, the philosopher, the day dreamer " (p. 43). We are assured that the day of philosophy is happily past (p. 726), philosophy from which " nothing ever comes " (p. 43). Thought is pulled down from the pedestal on which Descartes had mounted it; himself only a pretender, his famous phrase *Cogito ergo sum*, was only a mask, " was designed just to convince the church-fathers that he could find a place for soul in his philosophy " (p. 40). " Churchmen —all medicine-men in fact—have kept the public under control by making them believe " in the mysterious. " The motive is obvious. It is the only way the medicine-man can keep control. Science almost has had to blast its way through this wall of religious prejudice " (p. 40). As if science cleared away any mystery at all! What is more mysterious, utterly incomprehensible, than the revolution of an electron round its nucleus? The truth is, science *describes* physical facts amazingly well, but science *explains* absolutely nothing at all.

The reader may be left with this complete abjuration of religion, poetry, philosophy, and day-dreaming. Let him remember that this latter term will naturally include all or at least many forms of idealism and self-sacrifice. We read of Jeremiah Smith and his services freely donated to starving Hungary, " Undoubtedly Mr. Smith is a dreamer . . . he evidently is dreaming of the time when goodwill and international understanding will be universal ". Strangest of all, the Behaviorist is himself a day-dreamer of a most marked variety, and so stands self-condemned. The man who hopes " with this data well in hand " (p. 45) to control men as he control moths, to " build any man, starting at birth, into any kind of social or asocial being upon order [into a Homer? or Newton?], to take the worst adult social failure (provided he is biologically sound), pull him apart psychologically speaking and give him a new set of works " (p. 728)—if he is not a day-dreamer, who is? Doubtless there are many that rank Plato and Aristotle, Descartes and Kant as morbid growths on the body of humanity, whose glories are Hannibal, Caesar, Napoleon—why not Alaric, Attila, and Jenghiz Khan?—who are impatient with Riemann, Maxwell, and Henrich Hertz (though not perhaps with Marconi), and who consider old time hexameters and pentameters much inferior to the scientific achievements of to-day. Nevertheless, it may still be worth while to hold aloft the banner of Idealism, " torn but flying ", and to acknowledge an eternal truth in the gross exaggeration of Fichte: " Whatever is great and good in our own age is wholly due to this, that noble and strong men have for the sake of *ideas* made sacrifice of all the enjoyments of life ".

LAUGHTER AND THE COMIC

A CRITIQUE OF BERGSON'S THEORY OF THE COMIC

By RICHARD HOPE

M. Bergson's theory that laughter is a social gesture directed against the mechanical or lifeless in life, is, with the exception of Freud's, undoubtedly the most satisfactory theory that has yet been enunciated. It is more fundamental, it accounts for much more than other theories—in fact practically everything comic can be squeezed within its compass—and it views laughter from an evolutionary standpoint. Nevertheless, it fails to satisfy.

In the first place, M. Bergson does not explain what laughter itself is—a fatal omission, which must throw doubt upon any theory of laughter, however convincing it may be otherwise.

In the second place, he separates laughter off as an intellectual phenomenon. He says:—

> " The Comic . . . appeals to the intelligence pure and simple; laughter is incompatible with emotion. Depict some fault, however trifling, in such a way as to arouse sympathy, fear, or pity; the mischief is done, it is impossible for us to laugh. . . . *It must not arouse our feelings.*" (*Laughier: An Essay on the Meaning of the Comic*, 1911, page 139.)

The italics are M. Bergson's.

But laughter is quite often uncontrollable. There are times when a nervous person with a sense of the comic is as unable to control his laughter, as a nervous coward is unable to refrain from flight. Again, one might almost go so far as to say that comedy is delicious in so far as one can sympathize with the characters. Who can help but love Falstaff or Charlie's Aunt? As for fear, there are occasions when fear of a thing or person lends edge to the joke (the boy and his headmaster, for instance); and there are times when both hatred and defiance find their least objectionable expression in laughter. Fear will kill pity more effectively than it will kill laughter. Is pity therefore not emotional?

Thirdly, error is comic, though it is not necessarily mechanical. One can twist the scientist's error into the mechanical, but not the blunder of a child when it is due to faulty comparison or inability to judge differences.

Fourthly, man laughed long before he had machines.

Lastly, although M. Bergson says, " All that is serious in life comes from our freedom ", he never seems to realize that laughter is as closely connected with freedom as fear is with bondage. Laughter is the natural expression of freedom from anything; flight is the natural expression of a fear of the infringement of freedom. And an unlaughed laugh can be almost as uncomfortable as an unfled flight. Therefore, any satisfactory theory of the Comic must bring out this close association with freedom.

LAUGHTER

The correct definition of man is not " The animal which laughs ", nor is it, as M. Bergson suggests, " The animal which is laughed at ". Man is the animal which thinks and laughs; and between thought and laughter, man's two distinguishing characteristics, there is a very close causal connection. By thought I mean, not those unconscious processes which probably characterize every form of animal life and which we call instinct, but only those conscious processes by which man controls, or tries to control, his destiny.

This causal connection between thought and laughter is probably what led M. Bergson to say that laughter is incompatible with feeling. But thought is only an extension of the unconscious processes of thought; it is as impossible to think without feeling as it is to make love without feeling. The mathematician and the metaphysician enjoy thinking as much as the ordinary man enjoys playing games, otherwise they would probably ply some other trade.

But although thought does not cut man free from feeling it does give him a unique experience which is denied to the animal. It gives him a new freedom—freedom in Time. The animal is chained to, immersed in, the present; but man can move backward into the past and forward into the future, in memory and fantasy. Words are the instrument by means of which he gets a grip on Time. Throw genius into prison and he will create a new world for himself in which jails are not. Enslave the philosopher, and the humour of your action will be apparent to him; threaten him with death and he will laugh.

But the imprisoned animal loses all freedom and happiness, except such as he can get out of his immediate environment, out of the actual present. The kennelled dog does not think of hunting—his dreams may be of hunting, but that is another matter—his conscious feeling when he is awake is only an intense desire to hunt, feed, or do whatever his sensible environment would present him with the possibility of doing, were he but free.

Although this freedom in Time enormously expands the boundaries of man's experience, it gives him only one new unique experience, and it is that experience which makes laughter possible. He has the experience of detachment from the present, and consequently realizes his own separate individuality. He is conscious of separation from the world.

Owing to its immersion in the present, an animal's emotion is always immediately translated into action; to feel an emotion is to do something. But with man, because of his detachment from the present, experience may give rise to an emotion for which no outlet of suitable physical activity is available. He is emotionally moved, and yet, because of his detachment, there is nothing that he desires to do; so the emotion bubbles up in laughter. An emotional safety-valve lifts, the pressure is eased, and the noise which is made by the ' chattering ' of the valve, we call laughter.

The animal is personally concerned in everything; man is not. In some things he is impersonally concerned. The animal sits in the world and forms part of its living pageant. Man sits upon a pinnacle of individualism and watches the world roll past. Everything that he observes has its effect on him, perception awakens an emotional response which is appropriate to his character; but until he hurls himself into the pageant, or is drawn into it by circumstance, he is apart from it, and the more intellectually evolved he is, the more seldom does he completely merge himself in it.

Nevertheless, his detachment is superficial, he is bound to the pageant by innumerable ties of interest, affection, necessity, and dislike. Therefore he is acutely interested in it, and his interest expresses itself in approval or disapproval. That which he approves calls to him for help. That which he disapproves calls to him for hindrance. Consequently there is work for his emotion to do, even if it be only mental work, or the construction of a fantasy. But some things of which he disapproves do not call for hindrance. Possibly because of his detachment the exertion is not worth the candle. Possibly because he is not in a position to hinder—the schoolboy and his headmaster. Possibly because a hindrance of which he cordially approves is effectively applied by somebody or something else. Under these circumstances the thing may appear to him comic, and if so, the emotion resulting from its perception will probably escape in laughter.

Let us take a concrete case—an animal lover and his dog are seated together looking out of a window and watching the traffic in the street.

The butcher's van passes. The man is unmoved, but the dog is keenly alert. A pretty girl passes, with the opposite result, and the man starts a train of fantasy and possibly sighs. A horse and cart pass; the horse falls, and its driver lashes it brutally to make it get up. The man rushes out and the dog follows him barking. If the man is paralysed, he will shout for somebody. If he is dumb as well as paralysed, he will rage inwardly and start a train of fantasy, but a very different one from that evoked by the girl. It is even possible that he will break a blood-vessel instead of his heart; anyway, he will suffer emotional discomfort of a savage and violent, instead of a tender and sentimental, kind. A sense of humour will be of assistance in both cases. With the girl it may save him from breaking his heart, and with the horse from breaking a blood-vessel, by helping him to retain control of himself.

However, the storm blows over, and man and dog settle down once more. Presently fat, pompous old Mr. Bumblejohn comes strutting along, resplendent in his very best. A gust of wind sends his top hat spinning, he runs after it, slips on a banana skin, and stretches his length in the gutter. The dog is possibly excited by the attendant flurry, but the man is convulsed with laughter, not only because of Mr. Bumblejohn's mishap, but also because the emotional tension which remains over from the previous incident has taken advantage of the open safety-valve and has escaped as well.

THE COMIC

We have seen that laughter is the effervescing of an emotion which has no work to do, the chattering of an emotional safety-valve. Instead of the emotion stewing inside and breeding jealousies, hatreds, and troubles of all sorts, or giving birth to poems or romances; instead of being repressed, inhibited, sublimated, or worked off in the ordinary way, it comes out in laughter. We now want to discover what sort of incident has this effect—when and why an incident is comic.

Between the Comic and Humour there is a wide gulf fixed, as wide as that which separates the gamin from the aristocrat. They are of the same species, and the gamin may become an aristocrat, but the aristocrat will never descend to the level of the gamin—he has evolved beyond it. Therefore, in order to distinguish between the two, I shall rigidly exclude the word 'Humour' while discussing the Comic.

Two things are quite clear. To the undetached observer nothing is comic. Some measure of detachment is essential. And for a thing to be comic—not humorous—the observer must feel some measure of disapproval towards it, that is to say, it must appear to be in some way wrong. The Comic, therefore, is entirely a personal matter which depends upon the outlook of the observer. Nevertheless, there are certain universally accepted rights and wrongs which provide all the material necessary for our discussion.

M. Bergson begins his essay on the Comic by saying :—

> **" The first point to which attention should be called is that the Comic does not exist outside the pale of what is strictly *human*. A landscape may be beautiful, charming, and sublime, or insignificant and ugly ; it will never be laughable. You may laugh at an animal, but only because you have detected in it some human attitude or expression." (Page 3)**

But although frogs, monkeys, and even the praying mantis undoubtedly bear a resemblance to human beings, a waddling duck, a gawky puppy, or a crowing cock cannot be said to do so. And trees and shrubs, and even landscapes and mountains, are sometimes sufficiently grotesque and contrary to our ideas of what they ought to be like, for us to call them ' funny ', even if they cannot be classed as comic.

This approach, therefore, if not incorrect, is at any rate very debatable. But in another place M. Bergson says, " Our imagination has a very clear cut philosophy of its own." In *Creative Evolution* he also says, " Theory of knowledge and theory of life seem to us inseparable." And he never ceases to emphasize the point that life and consciousness are one.

One therefore feels continually that if only he had approached laughter from the point of view of the *elan vital*, as a joyous bursting forth of life energy, instead of trying to explain the Comic as " something mechanical encrusted on the living " ; if he had approached the problem internally, intuitionally, as a manifestation of life, instead of externally, intellectually, as a manifestation of death, his theory would have been much more acceptable.

Our imagination receives its " clear-cut philosophy " from the Life Force—where else can it come from ? In the animal we call this philosophy ' instinct '. Like the sense of the Comic it is primarily a sense of right and wrong. But owing to immersion in the present, the animal does not laugh at what is wrong—it either avoids it or else attacks it.

The first and most vitally important point about the Comic is that its perception does not involve any consciously intellectual process. A joke is judged by the feelings, not by the intellect ; and the Comic more often than not defies the intellect. Knowledge that one ought not to laugh increases the compulsion to laugh, and it is often intellectually puzzling to decide why one has laughed. But for this fact the problem of the Comic would have been settled long ago.

The roots of the Comic, therefore, must be sought in the Unconscious, which presumably is also the source of instinct.

Now, whatever may be said about the Unconscious in man, instinct is generally right, and, within its own boundaries, instinctive knowledge is invariably right. Right and wrong, therefore, can be regarded as approximating fairly closely to the Will of the Life Force for the species in question. And if we can see evolutionary or historical corroborative evidence that such knowledge is right, then we may feel practically certain that it is in agreement with the Will of the Life Force—which, after all, is as near as we can get to right and wrong.

Man instinctively knows that freedom is right for himself. Strength, success, intelligence, originality, and truth are also, sooner or later, instinctively known to be right, even by the criminal. Without them freedom is limited, and with them freedom is increased. And as the goal and crown of his endeavours man feels that harmony is right, and with harmony he somehow associates Love.

These propositions are as self-evident to man as the geometrical propositions to which Mr. Claremont draws attention in his extraordinarily interesting article.[1] And any infringement of them, which circumstances permit the observer to view with sufficient detachment, is comic.

Each of these propositions is expressible in terms of freedom. Love is freedom, and unlove is unfreedom. Harmony is the highest expression of freedom ; and having achieved harmony, the only path open to freedom is towards a higher harmony. Therefore the simplest definition of the comic is that any infringement of freedom which an observer can view with detachment, and which interests him, is comic.

Weakness, failure, stupidity, monotony, error, lack of harmony, unlove, and their causation, all can be comic ; and if there is one thing in particular which gives a sense of freedom it is a superiority to others, while if there is one thing which infringes freedom more than anything else it is inferiority. The downfall of Mr. Bumblejohn needed no mechanistic gesticulations to make it comic. It contained the alpha, and possibly also the omega, of the Comic.

One can observe a waddling duck with complete detachment. On dry land it is without freedom, grace, or harmony. Therefore it is comic. But swimming or flying it is not comic. A fish out of water is dying, and death is rarely comic because it is difficult to view with detachment. Moreover, even out of water a fish is graceful and beautiful. The Comic, therefore, obviously does " exist outside the pale of what is strictly human ". Man is not the only animal which is laughed at.

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[1] "The Problem of Intelligence ", *Psyche*, January, 1926.

The association between the Comic and the Unconscious is very close indeed. The Unconscious is the abode of our repressions, and our repressions are our most bitter bondages. Irrepressible laughter is always fed by a repression. Hysteria is an extreme case ; giggling is a more normal example. This helps us to understand why a lack of freedom in others is comic—it gives one a sense of power and freedom in oneself by contrast. The mere fact of seeing a joke gives one a sense of superiority, of joy ; and some complex or other is fairly certain to be implicated and to seize the opportunity to blow off steam. The Comic, as opposed to Humour, more often than not originates in a repression.

Therefore the first essential in the Comic is a certain measure of detachment in the observer ; a measure which varies with the occasion. Failing this detachment, nothing is comic.

The second essential is that the incident or thing shall evoke emotion in the observer, that is to say, it must have an immediate and vital application to him. Like Koko's, its function must be " particularly vital ". No incident has so vital a function as one which reminds us of some inferiority or lack of freedom in ourselves —if it be unconscious ; and of secondary vitality are those incidents which remind us of our superiority by showing us an inferiority or lack of freedom in others.

When detachment is insufficient, the emotion expresses itself in some degree of scorn, anger, or sorrow ; and the more violent the scorn, the likelier it is that a sore point has been touched. When the sorrow is genuine, and not merely an effective emotional outlet, a " tyranny of tears ", then the attachment is close, and a repression is probably not even remotely involved.

The Comic, therefore, is often a sort of vicarious atonement for our weakness. The Beaver joke is exquisitely comic to the beardless youth. Nobody appreciates the full subtlety of the mother-in-law joke so perfectly as the person who suffers from one. And if a joke has some subtle sexual association which enables it to evade the censor, as is usually the case with the skilful *double entendre*, its success is assured. In fact, it is in our various social bondages and conventions that the professional funny-man finds his most fruitful hunting-ground ; and the distinction between the humorist and the satirist is that the humorist is comparatively free from repressions, but the satirist is full of them, and finds a savage satisfaction in pillorying in others his own bondages.

Everybody, of course, is an anarchist at heart. But it is only the anarchist who has achieved freedom, who is a free man in the fullest sense of that much-abused term, who is merry at heart. His energies are not bound up in repressions, but flow freely forth in the joy of abundant life. The common or garden anarchist, he who is struggling with grim earnestness along the upward path to freedom, carries laughter as a torch and has but little of it in his heart. The more earnestly he grapples with a 'sin' which stands between him and freedom, the less he laughs.

The Puritan and the crank are terribly in earnest. The Dionysian Life Force surges within them and strains fiercely at the bonds of prayer and prohibition; with the result that the careless abundant energy of the free man is replaced by the plodding, fearful, lifeless, doleful repressions of the slave.

Before examining some of M. Bergson's principles of the Comic and his examples of their application, one point must be emphasized, although it is implicit in the principles just laid down. Except in the very lowest grades of the Comic, in its most infantile phases, a lack of freedom must be unconscious, if it is to be comic. The dog upon a lead, the prisoner, or the puritan who is conscious of his 'sin', are not comic. Even old Bumblejohn, lying on his back in the gutter, must not consciously realize the affront to his dignity, or one will begin to feel sorry for him. In order to continue being comic he must attack the banana skin, or scold the policeman for not having picked it up.

It is this unconsciousness which M. Bergson calls 'absentmindedness', and, which, naturally enough, he always finds in the Comic. The reason for its necessity is fairly obvious from the examples given. Conscious bondage awakens sympathy, and conscious bondage is therefore only comic to children and undeveloped personalities who either do not understand, or else are incapable of sympathy. The reason for this sympathy is probably that conscious bondage reminds us of our own struggles for freedom, and therefore awakens a fellow-feeling, a bond of unity, and the necessary detachment disappears.

M. Bergson's first example is that of a man who stumbles and falls while he is running. He says:—

> "It is not his sudden change of attitude that raises a laugh, but rather the involuntary element in this change—his clumsiness, in fact. Perhaps there was a stone on the road. He should have altered his pace or avoided the obstacle. Instead of that, through lack of elasticity, through absentmindedness and a kind of physical obstinacy, *as a result in fact of rigidity or of momentum*, the muscles continued to perform the same movement when the circumstances of the case called for something else. That is the reason of the man's fall, and also of the people's laughter." (Page 9)

Is it? The sudden change of attitude is certainly comic. The free man is abased, he has become a sprawling, and perhaps an angry, slave. The onlooker feels superiority. Involuntariness, i.e. the infringement of another's will, adds to this superiority. The clumsiness is the point on which the observer's disapproval seizes in order to disguise his not very moral or kindly feeling of superiority which is caused by the runner's abasement—it lifts the laughter from the infantile to the paternal. It is not the clumsiness alone that causes the laughter, but the clumsiness plus the abasement. M. Bergson omitted the most important factor. However mechanical the clumsiness might be, if it did not give the observer a feeling of superiority, he would not laugh.

The next example, a victim of a practical joke who is sent sprawling, M. Bergson says is comic for the same reason.

> "The laughable element in both cases consists of a certain *mechanical inelasticity*, just where one would expect to find the wide-awake adaptability and the living pliableness of a human being. The only difference in the two cases is that the former happened of itself, whilst the latter was obtained artificially." (Page 10)

The only difference! The difference is of vital importance. The practical joker spotted his slave, he disapproved of his slavery, and utilized it to give himself a veritable orgy of superiority, and to manifest that superiority to the world at large. If the joy in superiority were not so important a part of the Comic, the practical joker would be a *rara avis*.

> "All the same, in both cases the result has been brought about by an external circumstance. The Comic is therefore accidental: it remains, so to speak, in superficial contact with the person. How is it to penetrate within?" (Page 10)

He finds the penetration has taken place in the absent-minded person.

> "This time the Comic will take up its abode in the person himself; it is the person who will supply it with everything—matter and form, cause and opportunity. . . . Absentmindedness, indeed, is not perhaps the actual fountain-head of the comic, but surely it is contiguous to a certain stream of facts and fancies which flows straight from the fountain-head." (Page 11)

Presumably he means, not that the Comic has crept inside, but that the actuating cause has done so. But the actuating cause is always inside. There was an 'absent-mindedness' in the runner who stumbled over a stone. It was the 'absent-mindedness' of the second example that attracted the practical joker. What else is a "mechanical inelasticity" which replaces "wide-awake adaptability"? An external factor may or may not be necessary to exhibit the internal cause. That depends upon the stage of development which it has reached, but the cause is always internal, and so is the Comic.

Unconsciousness of one's own unfreedom is an invariable factor in the Comic. It is therefore very natural that when a person becomes unconscious of everything except his particular preoccupation, when his absent-mindedness develops into monomania, that he affords a continual opportunity for the practical joker.

Nevertheless, the absent-mindedness of a Newton calls for reverence rather than laughter. It is only when the great man boils his watch instead of his egg that his absorption becomes comic. We seize with avidity our opportunity of feeling superior to a giant. We never are so silly as to boil our watches.

> " When a certain comic effect has its origin in a certain cause, the more natural we regard the cause to be, the more comic shall we find the effect." (Page 12)

In other words, the more accurately the cause expresses the Will of the Life Force, the more comic the effect—naturally !

> " To imitate anyone is to bring out the element of automatism he has allowed to creep into his person. And as this is the very essence of the ludicrous, it is no wonder that imitation gives rise to laughter." (Page 33)

There are two factors which make mimicry comic. The first is that the mimic caricatures and exaggerates ; but this is a comparatively minor matter. The really important factor is that by mimicking he insults the person imitated, and therefore enormously increases our feeling of superiority. He is, so to speak, trampling on our victim.

On page 41 M. Bergson points out that Hecker, Kraepelin, and Lipps, three psychologists, all give different answers to the question, Why is the negro comic ? He says :—

> " There is a logic of the imagination which is not the logic of reason, one which at times is even opposed to the latter, with which, however, philosophy must reckon, not only in the study of the comic, but in every other investigation of the same kind. It is something like the logic of dreams, though of dreams that have not been left to the whim of individual fancy, being the dreams dreamt by the whole of society."

Two comments immediately suggest themselves. First, that M. Bergson has also said that " The comic . . . appeals to the intelligence, pure and simple." Secondly, that the above looks remarkably like a direct appeal to the Unconscious, and even goes so far as to speak of the " logic of dreams ".

However, M. Bergson tries to prove that a negro is comic because " a black face, in our imagination, is one daubed over with ink or soot ", and finally comes to the suggestion of a masquerade, a " nature that is mechanically tampered with ".

Presumably the French do not rejoice in the sea-side ' nigger-minstrel ', who obtains his comic effects by blacking his face and distorting the size and colour of his features so as to exploit and exaggerate the grotesqueness of the negro.

The negro is comic, not because our imaginations perform acrobatics and imagine him to be a white man, but principally because he tries to behave like a white man. His features are, of course, sometimes grotesque; but in his natural surroundings in Africa, the negro is not comic. He is whimsical and strange, perhaps, but chiefly he is pathetic or annoying, and sometimes alarming. It is when he starts pretending to be a white man that he begins to be comic, because his efforts to become unconscious of his blackness throw all its grotesque features into relief; his clumsiness and lack of intelligence, his parodies of civilization, become very evident, and give much satisfaction to our sense of superiority.

The most, therefore, that can be said for M. Bergson's explanation is that when the negro masquerades as a white man he appears comic, and that when a white man wants to insult an educated negro, he says that he reminds him of a 'nigger-minstrel', who is a white man dressed up to make a gross parody of the negro.

The monkey gives us a clear example of the same factor because he is so much more grotesque. But in the forest he can hardly be called comic. In the Zoo he becomes comic. In a house the comic element is emphasized; and it is brought to its culminating point by dressing him up. Then every grotesque feature is thrown into high relief by his clothes. The negro may remind me of a monkey dressed up—but surely never of a white man with his face blacked.

> "Any incident is comic that calls our attention to the physical in a person, when it is the moral side that is concerned." (Page 51)

Starting with "something mechanical encrusted upon the living", M. Bergson arrives at the above principle. But the principle needs no justification. It stares one in the face. Nothing is more obvious than that the body enslaves the spirit; and anything which calls attention to this slavery is therefore comic.

> "We laugh every time a person gives us the impression of being a thing." (Page 58)

M. Bergson instances Sancho Panza, tossed in the air like a football. Why like a football? The principle is implicit in and an extension of the preceding one; but the example is not wisely chosen. The only fairly good example which occurs to me at the moment is one which actually happened.

A small boy had a pet monkey to which he was very much devoted. It died, and as a special favour his parents had it stuffed and mounted in a glass case. His grandmother, to whom he was also very devoted, came to stay, and he took her to see his stuffed monkey. While she was duly admiring it he was closely observing her, and presently the result of his observations bore fruit in the question, "Granny, when you die will you be stuffed and put in a glass case like Jacko?"

Obviously the comicalness of the boy's question lies chiefly in the outrage on the old lady's dignity. His mistake is quite a minor matter, a mistaken, double-edged compliment at the most. It is at Granny and not at the boy that we laugh. She has been likened to a monkey, and the idea of the old lady as a stuffed thing follows immediately.

Sancho Panza, however, is not likened to a thing by being tossed in a quilt. Whoever heard of a football being tossed in a quilt? Moreover, Sancho's waving arms and legs, though adding to his comicalness, lessen any likeness to a thing. The comicalness lies in the insult to his dignity, and if it does occur to anybody that he was like a thing, that is only an additional insult. It would have been equally comic to trice him up by his heels and tickle his nose with a feather.

> "Any arrangement of acts and events is comic which gives us, in a single combination, the illusion of life and the distinct impression of mechanical arrangement." (Page 69)

M. Bergson instances the Jack-in-the-box, Punch and Judy, and then the irrepressible Pancrace in Molière's *Le Mariage Forcé*—although it can hardly be said that there is much *illusion* about the liveness of the obstinate philosopher. Indeed, it is the other way about. It is his likeness to life which makes him comic.

In the Jack-in-the-box, the combination of mechanical irrepressibility is comic, not so much because it is mechanical, as because it is irrepressible. One is inclined to trace the comicalness of the irrepressible straight back to the home of all repressions—the Unconscious. The irrepressible is always comic—even the irrepressible heroic lover runs a grave danger of becoming comic—and so it must be to us poor, repressed creatures whom Society only tolerates so long as we confine the impetuous, ever thrusting Life Force within the bonds of convention. Indeed, looked at in one way, nothing is so mechanically irrepressible as the Life Force, for its spring never relaxes, and its pressure is a perpetual momentum.

Moreover, in the irrepressible there is always a factor of surprise and surprise is the best releaser of emotion that there is, and therefore a sturdy ally of the comic. To be taken by surprise throws one off one's balance, destroys one's dignity, and subjects one to both the surpriser and the onlookers.

However, although the pig-headed stupidity and obsessional irrepressibility of Pancrace make him gloriously comic in himself, the final reappearance of his head through the window gets its magnificently comic climax through several other factors, one of which is entirely unconscious. It lies in the sexual symbolism which appeals directly to the Unconscious. This, added to the comic in the philosopher and the comic in the dismayed surprise of those who hoped that they had seen the last of him, must bring any house down anywhere. The Life Force, and every repression in every member of the audience, exults ferociously in that triumphant head.

The comicalness of the dancing jack, M. Bergson's next example (page 78) is the exact opposite of the above. In Geronte and Argante, we see the tame repressed automata, obedient to the comparatively free man, Scarpin. Therefore, we, poor repressed automata, get a great feeling of freedom and superiority by identifying ourselves with Scarpin.

Finally—for to deal with every example that M. Bergson gives would necessitate a book—there is what he calls the ' snowball ', or the cumulative principle (page 80) in which a small event, by setting in motion a chain of events of steadily increasing size and importance, ends by having the whole world by the ears.

His explanation is ingenious, but he overlooks the fact that cumulation by itself is not comic, and it is not necessarily even mechanical. It is used with equal effect in comedy and tragedy. In tragedy it helps to emphasize the remorseless onward march of fate, or the heroic obstinacy of the hero. The violent contrast between the little beginning and the great ending makes the tragedy more terrible. The cumulative effect of the events, like a gathering storm, overawes us with ominous omnipotence, but instead of blasting us with sudden horror, steadily and rhythmically increases our emotional tension until the dreadful climax is reached, and Romeo and Juliet lie dead, side by side.

In comedy exactly the same technique is applied, only instead of attaching the audience to the hero and heroine, the author detaches audience and actors from one another by making the characters foolish ; and he makes the cumulative events the results of their folly, or else uses them to increase and emphasize their folly. Then, after witnessing a terrific to-do about nothing, folly piled high upon folly's crown, the audience go home thoroughly pleased with themselves, thinking what fools all other mortals be—" we should never have behaved like that ! "—and consequently less oppressed by the feelings of inferiority with which they entered the theatre.

But since there is nothing intrinsically wrong about cumulation it is not in itself comic. The comedy lies in the increasing discomfiture of the characters, which is accomplished by a rhythmic, rather than a mechanical, increase of tribulation.

The 'as you were' theme which M. Bergson also ingeniously twists within the mechanical, is comic in itself. In a way it is the reverse of the 'snowball' principle. Whereas the snowball is a tiny cause with vast results, much ado about nothing, the 'as you were' theme is no results with vast causation, much ado for nothing. Nevertheless it is different, because no result is clearly wrong—it might be called a practical joke played by a Puck-like fate. And since it can be comic, it can also be tragic; but that is to approach the boundaries of humour.

However, since mechanism is a parody, a lifeless imitation of Life, a bondage imposed upon both matter and force, it is an analogy which excellently covers a vast number of human slaveries, and which therefore supplies a very convincing explanation of the Comic; especially when it is applied by a fertile and ingenious mind which has the true explanation of the Comic immanent within it, as M. Bergson obviously had when he wrote his essay. One is continually puzzled how it was that he managed to get so near to the real explanation and yet to evade it.

Laughter is undoubtedly a 'social gesture', and a 'corrective' one; albeit it is generally applied to others so as to avoid correcting oneself. Where the animal fiercely enjoys correcting that of which it disapproves, that which it perceives to be an 'imperfection', by slaughter, man is often sane enough to be content to correct by the milder joy of laughter. But ninety-nine times out of a hundred he does not know why he laughs, any more than the animal knows why it kills. Man is still very infantile, and those who have taken the next step up the evolutionary ladder, those rare souls in whom a sense of the Comic has developed into a sense of Humour, are still, alas, very few and far between. Still, the history of the Comic shows that they are steadily increasing. The *Bab Ballads* are a very definite step ahead of *Gulliver's Travels*.

PSYCHIC INSTABILITY AND THE RACE QUESTION

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In spite of all that has been said and written on the race question no practical solution of it has been found. This is due to several reasons, among which is the persistence of certain traditional and erroneous concepts relative to racial questions. Viewed rationally and in the light of modern anthropological findings, the race problem would cease to be a bugaboo and nightmare of American social life. If the results were not so often tragic the reasoning of a large number of white persons would be amusing. A hundred million white Americans are filled with a morbid fear of ten million members of an ' opposite ' race—a race that in reality is so little ' opposite ' that a million are often considered white by members of the ' white ' race, and so little homogeneous that from a racial standpoint it is hopelessly divided into a number of groups based on hereditary mental differences due to differences in the ethnic composition. Once the white man sees the question in its true light he will be amused at his ungrounded fears, the fears of a people who have failed to change their conceptions with a changing of the race problem.

The race problem is not the same to-day as it was yesterday. It constantly changes because the coloured race (so-called) constantly changes. The once sharply defined physical characteristics that separated the races no longer exist. By almost imperceptible degrees one race merges into the other. Certain racial characteristics common to savage peoples, which were once justly ascribed to the African transplanted in America, have disappeared as a result of a refounding and remoulding of the racial mass. The coloured American of to-day has, from an ethnical point of view, as little in common with the African, as the New Yorker has with the Dutch, the Pennsylvanian with the German, or the American Jew with the Palestinian. Many white persons, however, have failed to change their conceptions with these changing conditions.

They still think of the coloured people of to-day as being the direct and unadulterated descendants of the first boatload of African slaves brought to America in 1619.

What is the coloured group in America to-day? Should it be conceived as a homogeneous African tribe menacing the future peace and tranquility of America? Not by any means. It is an artificial, socially-created phenomenon. Its growing strength, its increasing restlessness, its *raison d'être* is due to the unjust treatment accorded it by the white man rather than to a sense of racial consciousness. This consciousness exists, of course, but it does not exist in the sense that the superficial observer thinks it does, and for the very simple reason that the group known as the 'coloured race' is too varied in its ethnic make-up. The apparent unity and homogeneity that exist are simply a natural rebellion against unjust conditions. It is the same feeling that would cause white, black, red, yellow, and brown prisoners in a penitentiary to revolt in concert against undue and unjust severity on the part of the administration. What we often call 'racial consciousness' in referring to the coloured group is more often than not simply group consciousness. Consciousness of race, very strong with the pure-blooded American Negro, grows weaker and weaker with a dimunition of the pure blood, changes into a consciousness of group, and finally becomes again a consciousness of race with those who are so white that their coloured blood does not show.

The coloured population of America is a heterogeneous, psychically unstable group, a fact which is to play an important part in the history of the American Republic. This fact should be taken into consideration in all discussions of the race problem, for a key to the solution of this problem is in a thorough understanding of the ethnical and psychical state of the coloured people.

History bears out the oft-made assertion that the greatest peoples have always been those with the most diverse ethnic origins. It could not be otherwise. A too intensive inbreeding is as dangerous for the race as for the family or village, for, as has often been proved, consanguineal marriages gradually sap the virility of a people. In backwood and isolated mountain villages where there is a great deal of intermarriage one sees an alarming number of sickly, deformed, and mentally weak individuals. The notorious physical and moral degeneracy of some of the rural communities of several of the southern states of the United States is due to this same condition. On the other hand a marked improvement in such regions has always followed an influx of new blood, made possible by a development of the means of transportation.

What is true of smaller groups is also true of the race, and " the race that is not renewed by the injection of new blood crystallizes and wastes away. The decadence of Spain in the seventeenth and eighteenth centuries was due to this same refinement of the blood. In antiquity the most beautiful, the greatest race of all times—the Greek race—died a victim of pride, from having jealously excluded all *mésalliances*. The duration of the Roman Empire, on the other hand, was made possible because the Latins allowed themselves to be assimilated by the conquered populations."[1]

Rome succeeded in maintaining its national existence for so long a time by impregnating with its genius eighty million disparate subjects scattered over the conquered provinces, and by making them morally and legally Roman citizens. France to-day is a striking example of this same condition. The French people —there is no French race—is an amalgamation of practically all the tribes that have surged across Europe. It is a comparatively modern people formed by the fusion of numerous and diverse ethnic elements. Romans, Greeks, Iberians, Celts, Germans, Normans have all been fused into a strong, homogeneous people ; and it is precisely this crossing and blending that accounts for the physical and especially the intellectual superiority of the French people, as well as for that universality so characteristic of French art, thought, and literature.

The coloured population of America is a new group being formed from two older ones ; it is a race in formation, a fact which explains its present psychic instability. For the crossing of races, although a means of improving the human stock, carries with it certain inconveniences, at least in the earlier stages. Races differ not only in their anatomical appearances, but in their mental equipment as well. Each primitive or historic race has certain instincts, tendencies, and mental habits peculiar to the individuals of that race. These tendencies and characteristics are firmly fixed. " They represent the past of a whole race, the result of the experiences and the actions of a long series of ancestors. Every individual that comes into the world brings this heritage with him. During his entire existence the past life of his ancestors weighs upon all his actions with a formidable weight. His character, that is, the ensemble of sentiments which will guide him in life, is the voice of his ancestors. . . . The part of the past is infinitely great, while that of the medium during the short duration of an existence is infinitely small."[2] This mental oneness and stability are what form the unity of a people; similarity of thoughts and of tendencies mark a people as comprising a homogeneous group.

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[1] A. Dauzat, " Le Préjugé des Races ", *La Reveue Politique et Parlementaire*, Aug. 1918.

[2] Gustave LeBon, *Lois psychologiques de l'évolution des peuples*.

In case of crossing between individuals of different groups, what happens to these racial characteristics? Do they remain distinct and separate in the offspring, refusing to unite; do they unite to form new tendencies; or are they destroyed without giving birth to new and distinctive ones? Dr. Berillon[1] answers: "It appears from my observations that the opposed tendencies of parents do not coalesce but simply remain superposed one upon the other without mixing. Whence these contradictory states of mind, which are usually expressed by such statements as: 'I cannot understand myself', 'I do not seem to be able to define myself', 'Why is it that I am always at war with utterly opposed sentiments?'" Apparently Berillon considers the psychic tendencies of a people as fixed and immutable. I am inclined to believe, however, that in case of crossing, the primitive ancestral tendencies are neutralized and new ones, formed in accordance with the action of the medium, are substituted for them. During the period that these new psychic tendencies are being produced we have an unstable third type between two approximately fixed primitive or historic types.

A new people, then, must necessarily lack a certain psychic definiteness and stability found in older or fixed peoples. I might add, however, that there are to-day very few definitely fixed peoples. The fixed element of the American population is insignificant, if it exists at all. Both the coloured and the white peoples of America are passing through a critical period—the infancy of a race. The white population is unstable because of the constant influx of Europeans and the gradual amalgamation of diverse ethnic elements already present; the coloured population because of infiltrations from the white race and marriages between individuals of different colour groups within the larger group.

This instability of the American population has been of inestimable value in the formation of a national spirit. A race in formation is very responsive to its environment, for the old, fixed, hereditary habits of the primitive groups have been weakened by the amalgamation. Consequently the new ethnic mass is more malleable, more susceptible to the medium. In fact it is only upon races in formation that the medium can exert a telling influence. The medium fixes the racial tendencies during the formative period of the race; after this they are transmitted by means of heredity to the subsequent generations. The ideals and psychic tendencies of the coloured man, having been formed in America, are in absolute accord with the fundamental principles of the American republic. Persons who differ radically in exterior physical appearances may be very similar from a psychological point of view. Physically there is a marked difference between the cultivated American white man and the cultivated American coloured man; psychically however, the latter often resembles the former much more closely than does a one- or two-generation Europo-American. The truth of this statement was strikingly illustrated during the war. While certain ethnic groups, not yet free from hereditary, old-world characteristics, systematically opposed America's participation in the war, the coloured man gave his whole-hearted and undivided allegiance to his country. He could not have done otherwise, for although his position in the American republic is unenviable, the fact remains that psychologically he is a product of that republic. He is attached to it by wide-spreading and century-old roots. Being all American he cannot but ' think American '.

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[1] *Les caractères nationaux*, Paris, 1920.

It is evident that this psychic instability which invariably follows the crossing of races is the indispensible means to an end. It is the *sine qua non* of a true nationalization. An Italian transported to America has changed nothing but his position; and even his children, born of old-world parents, actuated by hereditary tendencies centuries old, are just as Italian as the gamins of Naples. To make these Italian children truly American requires the destruction of the ancestral tendencies by amalgamation with peoples historically more American; after the old-world tendencies have been destroyed in the ' melting pot ' new tendencies shaped in accordance with American ideals take their place. And it is precisely because this melting process is taking place that the American people show a certain mental restlessness and instability.

How does this psychic instability of the American (both white and coloured) manifest itself? It is manifested by an unlimited energy, a diversity of sentiments, an individual initiative and importance not found in the older or historic societies where the race soul has killed the individual soul. Free from the hampering shackles of hereditary tradition, America is interested only in the future, a future full of hope and promise because the past, that insurmountable barrier to the future, is absent. That a long past often does become a barrier to progress is proved by the unequal development of the nations during the nineteenth and twentieth centuries. For me this unequal development is due to the hampering effects of centuries of tradition and a consequent psychic stability. When the revolutionary discoveries of the last century were made, the old fixed peoples were unable to appropriate these elements of progress. In travelling from the east to the west one sees a gradually increasing cultural advancement. Beginning with the more fixed peoples and moving towards the less fixed peoples one sees the facility with which new peoples can adapt themselves to changing conditions. " A certain stability of the racial soul lends great force to a nation, but a too complete stability becomes disastrous. Peoples who because of a lack of malleability are unable to adapt themselves to new conditions of living are doomed to decadence."[1]

The boundless energy and individual freedom of the American explain, according to Le Bon, the difficulty that socialistic doctrines have in implanting themselves in America. Socialism, to him, is the supreme tyranny of the state, and is possible only with peoples having a fairly fixed and uniform psychic equipment. This psychic stability is not yet found in America, although with the cessation of immigration and the gradual amalgamation of the various ethnic groups that is taking place, America is more and more acquiring a certain mental fixity.

For the present, however, a greater or less instability exists. In America the struggle between the races of mankind is still going on in the soul of the person of mixed blood. Add to this internal struggle the social status of the persons of the coloured group and their unenviable position becomes at once evident.

In this strangely heterogeneous group of the American coloured people, ranging from almost pure black to almost pure white, there often takes place a clash of ideals, a struggle between age-old emotions. For the American coloured people is not a homogeneous race bound together by ties of blood and common hereditary psychological tendencies, but simply a part of the new American people. The negro race, as it is conceived in America, is a social rather than a biological phenomenon. If black and white sometimes clash in the wide expanses of America is it incomprehensible that the ideals and tendencies of the two races clash within the confines of a human soul ? This clash of ideals, due to an unequal distribution of the blood and consequently the psychological tendencies of the two groups from which the coloured population has come, has manifested itself in many ways.

It is only recently, for instance, that Marcus Garvey wrote :[2] " I was a black man and had absolutely no right to lead. In the opinion of the ' coloured ' element, leadership should have been in the hands of a yellow or a very light man. On such flimsy prejudices our race has been retarded. There is more bitterness among us Negroes because of the caste of colour than there is between any other people, not excluding the people of India." Marcus Garvey simply states a condition, he does not give the cause. Superficially he ascribes the misunderstanding between colour groups to colour prejudice. The question of colour, however, is incidental, a concomitant and not a determining factor. Marcus Garvey fails to see the underlying and fundamental cause of this condition—a difference in hereditary and ancestral mental tendencies due to a difference in ethnic composition. Ordinarily, but by no means invariably, the coloured man tends to approach in appearance and mental characteristics the type whose blood is dominant in his veins; and the more closely he is related to one or the other of the types from which he is descended, the greater this resemblance becomes. Consequently there takes place within the group a certain unconscious grouping of those individuals whose similar and common heritage gives them a certain unity and oneness. That this psychic similarity is often accompanied by a certain physical similarity is only incidental. Colour prejudice, then, is not the cause of what seems to be a voluntary desire to move in cliques apparently based on colour; the real cause is a difference in the ethnic composition with a consequent difference in the mental heritage. A consciousness of race and of racial differences is not necessarily racial prejudice. Here, as in many other cases, we have an illustration of the heterogenity and psychic instability of the coloured population.

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[1] Gustave LeBon, *op. cit.*

[2] " The Negro's Greatest Enemy ", *Current History*, Sept. 1923.

Paradoxical as it may seem, however, this psychic instability is the index to the coloured American's potential strength and possibilities. It is a sign of his dual origin, with all the advantages that such a duality holds. It should also be proof conclusive that the so-called Negro race in America is not, and never will be, a menace to the white race. This race is not, as many erroneously think, composed of ten million direct descendants of the first African slaves; at the present time there is so much white blood in the group that it is impossible to say where one race ends and the other begins. The white man is afraid of a perhaps once true, but now erroneous, concept that has been jealously preserved and handed down by former generations. His concept of the Negro and the Negro problem is one of those legacies of the past which often prove so disastrous to the future.

Many coloured writers have felt and appreciated this duality and heterogeneity of race as the following excerpts will show. Others have felt it, but dared not express their sentiments for fear of being accused of 'wanting to be white'. Nothing, however, could be more absurd or farther from the truth; for, if the very light-coloured American were to be accepted by the white race and at the same time excluded by the coloured people his life would be no happier. The very light coloured man does not want to be white. He cannot be African. He is both at once, yet neither. He is like the tree growing on the property line of two farms, and which is attached to both the farms by its wide-spreading roots.

One of the first coloured writers to see the American Negro as he is—a being neither Caucasian nor African, but a fusion of the two—was Georgia Douglas Johnson, a coloured poetess of talent who has sung with a touching and pathetic melody the woes of a people outcasts and strangers at home. In *Cosmopolite* she meditates:—

Not wholly this or that
But wrought
Of Alien bloods am I,
A product of the interplay
Of traveled hearts.
Estranged, yet not estranged, I stand
All comprehending;
From my estate
I view earth's frail dilemma;
Scion of fused strength am I,
All understanding
Nor this nor that
Contains me.

And in the *Octoroon* she eloquently shows the result of trying to make a social phenomenon a biological one. Is it possible to write a more caustic denunciation of America's criminal folly than this little poem?

One drop of midnight in the dawn of life's pulsating stream
Marks her an alien from her kind, a shade amid its gleams,
Forever her steps she bends strange, insular, apart,
And none can read the riddle of her wildly warring heart.

But the woes of the octoroon are chiefly social and external; her heart is not nearly so divided as is the heart of the mulatto girl. The octoroon girl, being much nearer the pure type, has a correspondingly more stable psychic equipment; the heart of the mulatto girl, however, is torn apart as a result of her dual nature and her odious social status.

This duality of the coloured people is felt and admitted by all the penetrating thinkers of the group. This new people, formed by a fusion of African and Caucasian, cannot but be a source of strength and power for America. All of its traditions, all of its hopes, all of its ideals being American, it must form a bulwark of the republic. The fact that it has often been considered a menace is due to the perpetuation of a concept which, although comprehensible and perhaps true at its inception, has been rendered erroneous by a change in the phenomenon which it represented.

Prejudice of race in America is a national habit, and national habits are harder to break than personal habits. The collective volition of a people is hard to marshall and govern; consequently erroneous ideas persist long after the illusory theories that gave birth to them have passed away. To rid America of race prejudice will require a reforming of those concepts which prevent seeing the question as it is; but the progress of American civilization will always be hampered until America's concept of the Negro and the so-called Negro race is altered.

THE DIFFUSION CONTROVERSY

By ALEXANDER GOLDENWEISER

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The articles on The Diffusion of Culture (*Psyche*, October, 1926) by Professor G. Elliot Smith and Dr. Bronislaw Malinowski, call for a word of comment.

Differences in scientific views are wholesome. In a problem such as the diffusion of culture, with its many theoretical tangles and objective complexities, differences in point of view are not only pardonable but inevitable and necessary. Unfortunately, however, the gladiatorial combat in *Psyche* suffers both from misrepresentation of the views of opponents and from lack of clarity as to the real issues at hand.

When Professor Elliot Smith writes that " the theory maintained by the vast majority of anthropologists to-day is that in any community civilization can and did grow up and develop quite independently of similar events happening elsewhere in the world ", one may well ask for the names of the anthropologists who constitute this " vast majority ". Being one of the tribe myself, after a fashion, I experience difficulty in mentioning even a *single* anthropologist who holds such a view. All but the most dogmatic of the old-time evolutionists would have hesitated to exclude " all considerations of contact or prompting directly or indirectly " when similarities in beliefs and customs among different peoples are concerned. Tylor, for example, went out of his way repeatedly to repudiate such an attitude, to say nothing of modern ethnologists, including the " vast majority " of Americanists, to whom the tracing of culture contacts is ever of uppermost concern.

Again, when the famous anatomist writes : " It is utterly unjustifiable to assume, as modern ethnological theories implicitly do, that human behaviour was totally different before writing was devised. There is not a scrap of evidence to suggest that our unliterary predecessors had a remarkable aptitude for invention far transcending that of modern man. Nor again is there anything to justify the even more reckless assumption that this imaginary aptitude found expression in a stereotyped form in every place where ancient civilization developed ", against whom is this broadside directed? Surely not against American anthropologists, nor, for that matter, *any anthropologist of any account anywhere in the scientific world to-day*. For no such fabulous aptitude for invention is attributed to primitive man by any modern student of the subject; ethnologists assume most emphatically that human behaviour in primitive times was much the same as it is to-day; as to the " stereotyped form " in which " ancient civilization developed ", no one could outdo the modern ethnologist in his zeal to point out and appreciate the kaleidoscopic variety of patterns assumed by civilization in early days.

Having paved the way for the presentation of his theory in this questionable fashion, Professor Smith devotes the rest of his essay to citing attested instances of diffusion. But here also one cannot but feel that his efforts are being wasted. For no one doubts the *reality* of diffusion nor its importance in the building up of culture complexes.

Thus we reach the end of the author's study without reading one word about the real issues: Is there such a thing as independent invention? And, if so, is it frequent or exceptional? Also: is it always easy or even possible to determine whether similar customs or beliefs in two or more places are to be attributed to independent development or to the operation of diffusion in the course of historic contact?

In his reflections upon " The Life of Culture " Dr. Malinowski raises the discussion to a higher level of fairness and realism. We believe with him that " in the case of every modern invention, we know that it is invariably made and remade time after time in different places, by different men along slightly different roads, independently of one another ", and accept with him the truth that " every cultural achievement is due to a process or growth in which diffusion and invention have equal shares ". We share Dr. Malinowski's repudiation of a purely mechanical view of diffusion as a mere transfer of this or that from one place to another, and heartily endorse his insistence on the much more complicated nature of the facts of adoption and adaptation of cultural features. Dr. Malinowski is emphatically right in stressing the significance of biological and psychological factors which express themselves in similar urges and wants, and inevitably lead to similar solutions, at least in man's initial adjustments to nature and to culture.

On the other hand, when the author declares that " culture is not contagious ", that " it has neither been invented nor diffused, but imposed by the natural conditions which drive man upon the path of progress with inexorable determinism ", our sympathy is no longer aroused. For natural conditions do not drive man anywhere except to the extent that he must meet them ; moreover, what is " the path of progress " and is it a path of *progress*, always ? And where is the evidence for an " inexorable determinism " ? Nor are we illumined when reading that " the remedy for anthropology lies not in conjuring up one conjecture in the place of another, but in giving the Science of Man a foundation of real fact open to observation, in making it bear upon the practical and vital issues of the day ". Facts as such will not settle the issues before us—are not facts " scarcest raw material " ? —for the problem is one of interpretation and analysis ; nor is it at all clear by what magic the theoretical issues of diffusion and independent invention can be made to bear " upon the practical and vital issues of to-day ", nor why the " remedy for anthropology " should be sought in this direction.

Instead, it should have been made clear—as neither of the authors has done—that the study of children and the analysis of cultural situations where the facts and processes are *known*, bring irrefutable evidence of man's creativeness or inventive capacity ; that cultural diffusion and adaptation are as omnipresent and significant as invention ; that there are instances of cultural similarities of such complexity (as would be, for example, a Gothic cathedral in Australia) that diffusion can be decided upon without hesitation ; that in other instances, where a cultural feature is relatively simple and widespread (such as animism), repeated independent invention is equally obvious ; that in an enormous number of cases, on the other hand, no such facile decision is possible ; and that it is here that careful analysis and a thorough estimate of geographical and historical probability and evidence must be called into consultation. Also, when all this is done, a sufficiently large number of cases will remain where no safe or even tentative conclusion can be reached as between diffusion and independent invention. And, in honesty and fairness, this also must be admitted.

CURRENT INTELLIGENCE

PSYCHOLOGY IN AMERICA

Meetings—The Sixth International Congress of Philosophy, which took place during the middle of September at Harvard University, did not neglect the subject of psychology entirely, although the approach to it was naturally beset by the thickets of epistemology and metaphysics. At the session which was given over to the philosophy of mind, Professor Smith of Oxford, Professor Sheldon of Yale, Professor Overstreet of the College of the City of New York, Dr. Durant, and Dr. Wheelwright spoke. At another session Professor Hocking of Harvard discussed *Mind and Near Mind*. Some of the topics might appropriately have been taken up at a psychological meeting, e.g. Professor Starbuck's *The Empirical Study of Mysticism*—in which results of tests on mystically-minded students were submitted with conclusions which might be disputed by mystics—and a number of the papers in aesthetics.

The American Philosophical Association meets in Philadelphia the last week in December. The outstanding features of this conference will be reported in a later issue.

Laboratories—At Princeton, the experimental work in psychology is broadening out so as to cover a varied range. The more extensive investigations deal with: (1) The transfer of learning, (2) facial expression of emotion, (3) perception and memory of shapes, (4) studies of the conditioned reflex, and (5) the rôle of empathy in optical illusion, the latter being conducted by Professors Langfeld and Carmichael.

The New School of Social Research—This institution is developing a strong psychological department with the behavioristic and psycho-analytic strains in the ascendant. Aside from Dr. J. B. Watson, who was originally associated with the School, there are on its psychological staff, Dr. E. B. Holt, who is giving courses also at Princeton, Dr. Ferenczi, who is lecturing on psycho-analysis, and Dr. Leta Hollingworth.

Symposium on Spiritualism—The first practically international symposium on spiritualism is to begin shortly at Clark University, Worcester, Mass., where authorities in the field will argue the case both *pro* and *con*.

Sir Arthur Conan Doyle has already sent his manuscript to be read, and Sir Oliver Lodge has written that he approves the conference. A manuscript prepared by Harry Houdini before his death will be read at one of the sessions.

Other speakers will be Dr. L. R. G. Crandon, husband of the medium, 'Margery', Professor Joseph Jastrow of the University of Wisconsin, Dr. Walter F. Prince of the Boston Society for Psychical Research, Professor F. S. C. Schiller, professor of philosophy at Oxford University, England, Dr. Gardner Murphy of Columbia University, Frederick Bligh Bond of England, Mrs. Margaret Deland, American novelist, and Professor Hans Driesch, professor of philosophy at Leipzig University and president of the British Society for Psychical Research.

Publications—This has been an unusually fruitful period for psychological publications in the United States. A new series of monographs under the title "Studies in Psychology and Psychiatry" has begun to appear under the aegis of the Catholic University of America. The first two studies are respectively on the *Psychology of Reasoning* by Miriam F. Dunn, and *Diastatic Activity of the Blood Serum in Mental Disorders* by John W. Rauth.

Among the new monographs are *An Experimental Study of the Self in Psychology*, by Elizabeth W. Amen; *A Study of the Test Performance of American, Mexican, and Negro Children*, by Helen L. Koch and Rietta Simmons; *Disability in Reading and its Relation to Personality*, by Elizabeth C. Hincks; *Thermal Discrimination and Weber's Law*, by G. A. K. Culler.

The "Psychological Classics" series announces an English translation of several of Lipp's papers.

Of the more important volumes that have been published very recently are Geza Róheim's *Social Anthropology*, which is a psychoanalytic interpretation of the subject; the second volume of *Genetic Studies of Genius* dealing with the "early mental traits of three hundred geniuses" by Catherine M. Cox (edited by L. M. Terman); *The Psychology of Thought Approached through Studies of Sleeping and Dreaming* by H. L. Hollingsworth; Healy and Bronner's *Delinquents and Criminals*; Murchison's *Criminal Intelligence*; *Man and His Affairs* (written from an engineer's point of view) by W. N. Polakov; MacFie Campbell's *Delusion and Belief*; Gardner's *Psychology and Preaching*. Perhaps also Roback's

Psychology of Character should be included as an American production.

Obituary—The untimely death of Harry Houdini, foremost mystericist, is not to be passed over without a word of comment, for although Houdini was only indirectly associated with psychology, he had, through his deep interest in the occult and expertness in exposing fraudulent mediums, served in the capacity of a watchman for psychology.

As expected, a number of spiritualists have been submitting messages purporting to come from Houdini 'on the other side,' but none of these messages has the key words which Houdini had devised while alive and communicated to Mrs. Houdini and one other person.

A. A. Roback

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